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MAY 31 2022

**GROUND WATER  
 QUALITY BUREAU**



**Environmental Management**  
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*Date:* May 31, 2022  
*Refer To:* N3B-2022-0182

Justin Ball, Chief  
 Ground Water Quality Bureau  
 New Mexico Environment Department  
 1190 S. St. Francis Drive  
 Santa Fe, NM 87502-5469

**Subject: Submittal of the Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2022 Quarter 1, Class V Underground Injection Control Wells**

Dear Mr. Ball:

On August 31, 2016, the New Mexico Environment Department (NMED) issued Discharge Permit 1835 (DP-1835) to the U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (LANS) for the discharge of treated groundwater to the regional aquifer from up to six Class V underground injection control (UIC) wells. On July 21, 2017, NMED approved minor updates to DP-1835. During the second quarter of calendar year (CY) 2018, ownership of the discharge permit transferred to Newport News Nuclear BWXT-Los Alamos, LLC (N3B) from LANS. Pursuant to Condition Number 10 of the above-referenced discharge permit, DOE/N3B are required to submit quarterly reports for the previous quarter to document the following:

1. influent and discharge volumes from the treatment systems,
2. quarterly groundwater and treated effluent sampling results, and
3. operations and maintenance activities.

Pursuant to Condition Numbers No. 11, 12, and 13 of DP-1835, the quarterly reports shall also contain general information, performance information, and monitoring data for treated effluent from each ion exchange treatment system. Condition Number 10 requires submission of a quarterly report to NMED by June 1, 2022, for the January 1 through March 31, 2022, discharge period.

During the CY 2022 Quarter 1 reporting period for DP-1835, discharge of treated groundwater to the regional aquifer occurred at five UIC wells: CrIN-1 through CrIN-5. Groundwater originated predominantly from five extraction wells: CrEX-1 through CrEX-5. The groundwater was treated by chromium treatment unit A (CTUA) and chromium treatment unit C (CTUC) before injection at the UIC wells.

The enclosed "Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2022 Quarter 1," provides the information required under DP-1835 for this reporting period.

If you have questions, please contact Christian Maupin at (505) 695-4281 (christian.maupin@em-la.doe.gov) or Cheryl Rodriguez at (505) 414-0450 (cheryl.rodriguez@em.doe.gov).

Sincerely,



Joseph Murdock  
Program Manager  
Environment, Safety and Health  
N3B-Los Alamos

Sincerely,

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Date: 2022.05.26  
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Arturo Q. Duran  
Office of Quality and Regulatory Compliance  
U.S. Department of Energy  
Environmental Management  
Los Alamos Field Office

Enclosure(s):

1. Two hard copies with electronic files – Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2022 Quarter 1 (EM2022-0287)

cc (letter and enclosure[s] emailed):

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**Quarterly Report for the  
Discharge of Treated  
Groundwater to the  
Regional Aquifer under  
Discharge Permit 1835,  
Calendar Year 2022 Quarter 1**

Newport News Nuclear BWXT-Los Alamos, LLC (N3B), under the U.S. Department of Energy Office of Environmental Management Contract No. 89303318CEM000007 (the Los Alamos Legacy Cleanup Contract), has prepared this document. The public may copy and use this document without charge, provided that this notice and any statement of authorship are reproduced on all copies.

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## **1.0 INTRODUCTION**

On August 31, 2016, the New Mexico Environment Department (NMED) issued Discharge Permit 1835 (DP-1835) to the U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (LANS) for the discharge of treated groundwater to the regional aquifer through Class V underground injection control (UIC) wells. On July 21, 2017, NMED approved minor updates to DP-1835. During Quarter 2 of calendar year (CY) 2018, ownership of the discharge permit transferred from LANS to Newport News Nuclear BWXT-Los Alamos, LLC (N3B).

During the CY 2022 Quarter 1 reporting period for DP-1835, groundwater was extracted for treatment from five extraction wells: CrEX-1 through CrEX-5. The groundwater was treated by ion exchange (IX) in chromium treatment unit A (CTUA) and chromium treatment unit C (CTUC). Discharge of treated groundwater to the regional aquifer occurred at five UIC wells: CrIN-1 through CrIN-5.

Condition No. 10 of DP-1835 requires submission of a quarterly report to NMED by June 1 for the January 1 through March 31 discharge period. Several conditions within the permit identify information to be submitted in the quarterly report. These conditions are addressed in this report in the following requirements:

1. Influent and discharge volumes for the IX treatment systems (Condition No. 10)
2. Quarterly treated effluent sampling results from each IX treatment system (Conditions No. 10 and 13)
3. Quarterly depth-to-groundwater and groundwater-quality sampling results (Conditions No. 10 and 14)
4. Any operations/maintenance activities performed (Condition No. 10)
5. Any periodic test of mechanical integrity conducted (Condition No. 11.a)
6. Any replacement of primary or secondary IX vessels or associated treatment system infrastructure (Condition No. 11.b)
7. Any well workovers conducted (Condition No. 11.c)
8. Any additional operational changes with the potential to markedly affect the discharge (Condition No. 11.d)
9. Monthly average, maximum, and minimum values for flow rate and volume of treated effluent transferred to each UIC well (Condition No. 12.a)
10. Total monthly volume of treated effluent transferred to each UIC well (Condition No. 12.b)
11. Monthly average, maximum, and minimum values of injection water level (pressure head) above static level for each UIC well (Condition No. 12.c)
12. Daily volume injected at each UIC well (Condition No. 12.d)
13. Daily volume pumped from each extraction well (Condition No. 12.e)
14. Facility layout map (Condition No. 14)
15. Groundwater elevation contour map (Condition No. 15)

This report addresses each of these requirements.

## 2.0 REQUIREMENTS

### 2.1 Influent and Discharge Volumes for the Ion Exchange Treatment Systems (Requirement 1)

Table 2.1-1 provides the influent and discharge volumes for IX treatment systems CTUA and CTUC during CY 2022 Quarter 1 for activities completed under DP-1835.

**Table 2.1-1**  
**Total Influent and Discharge Volumes**  
**for IX Treatment Systems – CY 2022 Quarter 1, DP-1835**

| Treatment Unit | Influent Volume <sup>a</sup><br>(gal.) | Effluent Volume <sup>b</sup><br>(gal.) |
|----------------|----------------------------------------|----------------------------------------|
| CTUA           | 11,865,808                             | 6,222,083                              |
| CTUC           |                                        | 5,704,500                              |

Note: Individual flow meter accurate to  $\pm 5\%$ .

<sup>a</sup> Influent volume based on CrEX-1 through CrEX-5 extraction volumes.

<sup>b</sup> Effluent volume based on CTUA and CTUC flow-meter readings.

### 2.2 Quarterly Treated Effluent Sampling Results from Each IX Treatment System (Requirement 2)

Treated effluent analytical results from samples collected during CY 2022 Quarter 1 for activities completed under DP-1835 are summarized in Table 2.2-1. No sample results for total chromium, nitrate, perchlorate, sulfate, fluoride, chloride, or total dissolved solids exceeded 90% of the numeric standards of 20.6.2.3103 New Mexico Administrative Code (NMAC) or, for constituents not listed in 20.6.2.3103 NMAC, 90% of the numeric screening levels established for tap water in Table A-1 of the 2021 NMED “Risk Assessment Guidance for Site Investigations and Remediation Volume 1, Soil Screening Guidance for Human Health Risk Assessments” (NMED 2021). The 90% values for these seven analytes are as follows:

- Chromium 45 µg/L
- Nitrate 9 mg/L
- Perchlorate 12.4 µg/L
- Sulfate 540 mg/L
- Fluoride 1.44 mg/L
- Chloride 225 mg/L
- Total dissolved solids 900 mg/L

**Table 2.2-1**  
**Treated Effluent Analytical Results Summary Table – CY 2022 Quarter 1, DP-1835**

| Location ID | Sample ID      | Sample Date <sup>a</sup> | Parameter Name | Result | Report Unit | 90% of Standard or Screening Level | Lab Qualifier    | Detect Flag    | Filtered       | Method Detection Limit |
|-------------|----------------|--------------------------|----------------|--------|-------------|------------------------------------|------------------|----------------|----------------|------------------------|
| CTUA        | CTUA-22-235062 | 1/3/2022                 | Chloride       | 21.2   | mg/L        | 225                                | n/a <sup>b</sup> | Y <sup>c</sup> | Y <sup>d</sup> | 0.335                  |
| CTUA        | CTUA-22-239608 | 1/11/2022                | Chloride       | 18.2   | mg/L        | 225                                | n/a              | Y              | Y              | 0.335                  |
| CTUA        | CTUA-22-239609 | 1/18/2022                | Chloride       | 19.1   | mg/L        | 225                                | n/a              | Y              | Y              | 0.335                  |
| CTUA        | CTUA-22-239610 | 1/24/2022                | Chloride       | 18.5   | mg/L        | 225                                | n/a              | Y              | Y              | 0.335                  |
| CTUA        | CTUA-22-239611 | 3/23/2022                | Chloride       | 19.5   | mg/L        | 225                                | n/a              | Y              | Y              | 0.335                  |
| CTUA        | CTUA-22-239612 | 3/28/2022                | Chloride       | 20.3   | mg/L        | 225                                | n/a              | Y              | Y              | 0.335                  |
| CTUC        | CTUC-22-235323 | 1/3/2022                 | Chloride       | 18.2   | mg/L        | 225                                | n/a              | Y              | Y              | 0.335                  |
| CTUC        | CTUC-22-239622 | 1/11/2022                | Chloride       | 18     | mg/L        | 225                                | n/a              | Y              | Y              | 0.335                  |
| CTUC        | CTUC-22-239623 | 1/18/2022                | Chloride       | 18.9   | mg/L        | 225                                | n/a              | Y              | Y              | 0.335                  |
| CTUC        | CTUC-22-239624 | 1/24/2022                | Chloride       | 21.4   | mg/L        | 225                                | n/a              | Y              | Y              | 0.335                  |
| CTUC        | CTUC-22-239625 | 3/8/2022                 | Chloride       | 18.1   | mg/L        | 225                                | n/a              | Y              | Y              | 0.335                  |
| CTUC        | CTUC-22-239627 | 3/16/2022                | Chloride       | 20.6   | mg/L        | 225                                | n/a              | Y              | Y              | 0.335                  |
| CTUC        | CTUC-22-239626 | 3/23/2022                | Chloride       | 20.1   | mg/L        | 225                                | n/a              | Y              | Y              | 0.335                  |
| CTUC        | CTUC-22-239628 | 3/28/2022                | Chloride       | 20.6   | mg/L        | 225                                | n/a              | Y              | Y              | 0.335                  |
| CTUA        | CTUA-22-235062 | 1/3/2022                 | Chromium       | 3      | µg/L        | 45                                 | U <sup>e</sup>   | N <sup>f</sup> | Y              | 3                      |
| CTUA        | CTUA-22-239608 | 1/11/2022                | Chromium       | 3      | µg/L        | 45                                 | U                | N              | Y              | 3                      |
| CTUA        | CTUA-22-239609 | 1/18/2022                | Chromium       | 3      | µg/L        | 45                                 | U                | N              | Y              | 3                      |
| CTUA        | CTUA-22-239610 | 1/24/2022                | Chromium       | 3      | µg/L        | 45                                 | U                | N              | Y              | 3                      |
| CTUA        | CTUA-22-239611 | 3/23/2022                | Chromium       | 3      | µg/L        | 45                                 | U                | N              | Y              | 3                      |
| CTUA        | CTUA-22-239612 | 3/28/2022                | Chromium       | 3      | µg/L        | 45                                 | U                | N              | Y              | 3                      |
| CTUC        | CTUC-22-235323 | 1/3/2022                 | Chromium       | 3      | µg/L        | 45                                 | U                | N              | Y              | 3                      |
| CTUC        | CTUC-22-239622 | 1/11/2022                | Chromium       | 3      | µg/L        | 45                                 | U                | N              | Y              | 3                      |
| CTUC        | CTUC-22-239623 | 1/18/2022                | Chromium       | 3      | µg/L        | 45                                 | U                | N              | Y              | 3                      |
| CTUC        | CTUC-22-239624 | 1/24/2022                | Chromium       | 3      | µg/L        | 45                                 | U                | N              | Y              | 3                      |

Table 2.2-1 (continued)

| Location ID | Sample ID      | Sample Date <sup>a</sup> | Parameter Name              | Result | Report Unit | 90% of Standard or Screening Level | Lab Qualifier | Detect Flag | Filtered | Method Detection Limit |
|-------------|----------------|--------------------------|-----------------------------|--------|-------------|------------------------------------|---------------|-------------|----------|------------------------|
| CTUC        | CTUC-22-239625 | 3/8/2022                 | Chromium                    | 3      | µg/L        | 45                                 | U             | N           | Y        | 3                      |
| CTUC        | CTUC-22-239627 | 3/16/2022                | Chromium                    | 3      | µg/L        | 45                                 | U             | N           | Y        | 3                      |
| CTUC        | CTUC-22-239626 | 3/23/2022                | Chromium                    | 3      | µg/L        | 45                                 | U             | N           | Y        | 3                      |
| CTUC        | CTUC-22-239628 | 3/28/2022                | Chromium                    | 3      | µg/L        | 45                                 | U             | N           | Y        | 3                      |
| CTUA        | CTUA-22-235062 | 1/3/2022                 | Fluoride                    | 0.324  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUA        | CTUA-22-239608 | 1/11/2022                | Fluoride                    | 0.338  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUA        | CTUA-22-239609 | 1/18/2022                | Fluoride                    | 0.181  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUA        | CTUA-22-239610 | 1/24/2022                | Fluoride                    | 0.249  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUA        | CTUA-22-239611 | 3/23/2022                | Fluoride                    | 0.359  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUA        | CTUA-22-239612 | 3/28/2022                | Fluoride                    | 0.337  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUC        | CTUC-22-235323 | 1/3/2022                 | Fluoride                    | 0.261  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUC        | CTUC-22-239622 | 1/11/2022                | Fluoride                    | 0.328  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUC        | CTUC-22-239623 | 1/18/2022                | Fluoride                    | 0.182  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUC        | CTUC-22-239624 | 1/24/2022                | Fluoride                    | 0.381  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUC        | CTUC-22-239625 | 3/8/2022                 | Fluoride                    | 0.259  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUC        | CTUC-22-239627 | 3/16/2022                | Fluoride                    | 0.422  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUC        | CTUC-22-239626 | 3/23/2022                | Fluoride                    | 0.515  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUC        | CTUC-22-239628 | 3/28/2022                | Fluoride                    | 0.345  | mg/L        | 1.44                               | n/a           | Y           | Y        | 0.033                  |
| CTUA        | CTUA-22-235062 | 1/3/2022                 | Nitrate-Nitrite as Nitrogen | 4.88   | mg/L        | 9                                  | n/a           | Y           | Y        | 0.085                  |
| CTUA        | CTUA-22-239608 | 1/11/2022                | Nitrate-Nitrite as Nitrogen | 3.55   | mg/L        | 9                                  | n/a           | Y           | Y        | 0.17                   |
| CTUA        | CTUA-22-239609 | 1/18/2022                | Nitrate-Nitrite as Nitrogen | 3.51   | mg/L        | 9                                  | n/a           | Y           | Y        | 0.17                   |
| CTUA        | CTUA-22-239610 | 1/24/2022                | Nitrate-Nitrite as Nitrogen | 3.3    | mg/L        | 9                                  | n/a           | Y           | Y        | 0.085                  |
| CTUA        | CTUA-22-239611 | 3/23/2022                | Nitrate-Nitrite as Nitrogen | 3.5    | mg/L        | 9                                  | n/a           | Y           | Y        | 0.085                  |
| CTUA        | CTUA-22-239612 | 3/28/2022                | Nitrate-Nitrite as Nitrogen | 3.54   | mg/L        | 9                                  | n/a           | Y           | Y        | 0.17                   |
| CTUC        | CTUC-22-235323 | 1/3/2022                 | Nitrate-Nitrite as Nitrogen | 3.45   | mg/L        | 9                                  | n/a           | Y           | Y        | 0.085                  |
| CTUC        | CTUC-22-239622 | 1/11/2022                | Nitrate-Nitrite as Nitrogen | 3.56   | mg/L        | 9                                  | n/a           | Y           | Y        | 0.17                   |

Table 2.2-1 (continued)

| Location ID | Sample ID      | Sample Date <sup>a</sup> | Parameter Name              | Result | Report Unit | 90% of Standard or Screening Level | Lab Qualifier | Detect Flag | Filtered | Method Detection Limit |
|-------------|----------------|--------------------------|-----------------------------|--------|-------------|------------------------------------|---------------|-------------|----------|------------------------|
| CTUC        | CTUC-22-239623 | 1/18/2022                | Nitrate-Nitrite as Nitrogen | 3.52   | mg/L        | 9                                  | n/a           | Y           | Y        | 0.17                   |
| CTUC        | CTUC-22-239624 | 1/24/2022                | Nitrate-Nitrite as Nitrogen | 4.98   | mg/L        | 9                                  | n/a           | Y           | Y        | 0.17                   |
| CTUC        | CTUC-22-239625 | 3/8/2022                 | Nitrate-Nitrite as Nitrogen | 3.62   | mg/L        | 9                                  | n/a           | Y           | Y        | 0.085                  |
| CTUC        | CTUC-22-239627 | 3/16/2022                | Nitrate-Nitrite as Nitrogen | 3.8    | mg/L        | 9                                  | n/a           | Y           | Y        | 0.17                   |
| CTUC        | CTUC-22-239626 | 3/23/2022                | Nitrate-Nitrite as Nitrogen | 3.8    | mg/L        | 9                                  | n/a           | Y           | Y        | 0.085                  |
| CTUC        | CTUC-22-239628 | 3/28/2022                | Nitrate-Nitrite as Nitrogen | 3.58   | mg/L        | 9                                  | n/a           | Y           | Y        | 0.17                   |
| CTUA        | CTUA-22-235062 | 1/3/2022                 | Perchlorate                 | 0.373  | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUA        | CTUA-22-239608 | 1/11/2022                | Perchlorate                 | 0.467  | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUA        | CTUA-22-239609 | 1/18/2022                | Perchlorate                 | 0.59   | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUA        | CTUA-22-239610 | 1/24/2022                | Perchlorate                 | 0.463  | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUA        | CTUA-22-239611 | 3/23/2022                | Perchlorate                 | 0.463  | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUA        | CTUA-22-239612 | 3/28/2022                | Perchlorate                 | 0.478  | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUC        | CTUC-22-235323 | 1/3/2022                 | Perchlorate                 | 0.452  | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUC        | CTUC-22-239622 | 1/11/2022                | Perchlorate                 | 0.447  | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUC        | CTUC-22-239623 | 1/18/2022                | Perchlorate                 | 0.469  | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUC        | CTUC-22-239624 | 1/24/2022                | Perchlorate                 | 0.747  | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUC        | CTUC-22-239625 | 3/8/2022                 | Perchlorate                 | 0.92   | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUC        | CTUC-22-239627 | 3/16/2022                | Perchlorate                 | 1.07   | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUC        | CTUC-22-239626 | 3/23/2022                | Perchlorate                 | 1.08   | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUC        | CTUC-22-239628 | 3/28/2022                | Perchlorate                 | 1.07   | µg/L        | 12.4                               | n/a           | Y           | Y        | 0.05                   |
| CTUA        | CTUA-22-235062 | 1/3/2022                 | Sulfate                     | 8.66   | mg/L        | 540                                | n/a           | Y           | Y        | 0.133                  |
| CTUA        | CTUA-22-239608 | 1/11/2022                | Sulfate                     | 26.4   | mg/L        | 540                                | n/a           | Y           | Y        | 0.665                  |
| CTUA        | CTUA-22-239609 | 1/18/2022                | Sulfate                     | 28.1   | mg/L        | 540                                | n/a           | Y           | Y        | 0.665                  |
| CTUA        | CTUA-22-239610 | 1/24/2022                | Sulfate                     | 28     | mg/L        | 540                                | n/a           | Y           | Y        | 0.266                  |
| CTUA        | CTUA-22-239611 | 3/23/2022                | Sulfate                     | 28.3   | mg/L        | 540                                | n/a           | Y           | Y        | 0.665                  |
| CTUA        | CTUA-22-239612 | 3/28/2022                | Sulfate                     | 29.1   | mg/L        | 540                                | n/a           | Y           | Y        | 0.665                  |
| CTUC        | CTUC-22-235323 | 1/3/2022                 | Sulfate                     | 26.4   | mg/L        | 540                                | n/a           | Y           | Y        | 0.665                  |

Table 2.2-1 (continued)

| Location ID | Sample ID      | Sample Date <sup>a</sup> | Parameter Name         | Result | Report Unit | 90% of Standard or Screening Level | Lab Qualifier | Detect Flag | Filtered | Method Detection Limit |
|-------------|----------------|--------------------------|------------------------|--------|-------------|------------------------------------|---------------|-------------|----------|------------------------|
| CTUC        | CTUC-22-239622 | 1/11/2022                | Sulfate                | 26.1   | mg/L        | 540                                | n/a           | Y           | Y        | 0.665                  |
| CTUC        | CTUC-22-239623 | 1/18/2022                | Sulfate                | 28.1   | mg/L        | 540                                | n/a           | Y           | Y        | 0.665                  |
| CTUC        | CTUC-22-239624 | 1/24/2022                | Sulfate                | 5.9    | mg/L        | 540                                | n/a           | Y           | Y        | 0.133                  |
| CTUC        | CTUC-22-239625 | 3/8/2022                 | Sulfate                | 21.2   | mg/L        | 540                                | n/a           | Y           | Y        | 0.665                  |
| CTUC        | CTUC-22-239627 | 3/16/2022                | Sulfate                | 32.1   | mg/L        | 540                                | n/a           | Y           | Y        | 0.665                  |
| CTUC        | CTUC-22-239626 | 3/23/2022                | Sulfate                | 30.6   | mg/L        | 540                                | n/a           | Y           | Y        | 0.665                  |
| CTUC        | CTUC-22-239628 | 3/28/2022                | Sulfate                | 29.3   | mg/L        | 540                                | n/a           | Y           | Y        | 0.665                  |
| CTUA        | CTUA-22-235062 | 1/3/2022                 | Total Dissolved Solids | 229    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |
| CTUA        | CTUA-22-239608 | 1/11/2022                | Total Dissolved Solids | 246    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |
| CTUA        | CTUA-22-239609 | 1/18/2022                | Total Dissolved Solids | 261    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |
| CTUA        | CTUA-22-239610 | 1/24/2022                | Total Dissolved Solids | 250    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |
| CTUA        | CTUA-22-239611 | 3/23/2022                | Total Dissolved Solids | 257    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |
| CTUA        | CTUA-22-239612 | 3/28/2022                | Total Dissolved Solids | 247    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |
| CTUC        | CTUC-22-235323 | 1/3/2022                 | Total Dissolved Solids | 219    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |
| CTUC        | CTUC-22-239622 | 1/11/2022                | Total Dissolved Solids | 240    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |
| CTUC        | CTUC-22-239623 | 1/18/2022                | Total Dissolved Solids | 256    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |
| CTUC        | CTUC-22-239624 | 1/24/2022                | Total Dissolved Solids | 239    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |
| CTUC        | CTUC-22-239625 | 3/8/2022                 | Total Dissolved Solids | 229    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |
| CTUC        | CTUC-22-239627 | 3/16/2022                | Total Dissolved Solids | 256    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |
| CTUC        | CTUC-22-239626 | 3/23/2022                | Total Dissolved Solids | 231    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |
| CTUC        | CTUC-22-239628 | 3/28/2022                | Total Dissolved Solids | 260    | mg/L        | 900                                | n/a           | Y           | Y        | 3.4                    |

<sup>a</sup> In accordance with Condition No. 13 of DP-1835, analysis of the treated effluent from each IX unit is required only once every month for the CY 2022 Quarter 1 reporting period.

<sup>b</sup> n/a = Not applicable: no qualifiers applied.

<sup>c</sup> In the Detect Flag column, Y = detected.

<sup>d</sup> In the Filtered column, Y = filtered.

<sup>e</sup> U = Analyte is classified as not detected.

<sup>f</sup> N = No (not detected).

The pilot-scale molasses and sodium dithionite amendment studies began with NMED conditional approvals during CY 2017 Quarter 4 (NMED 2017a, NMED 2017b), and continued during CY 2022 Quarter 1. NMED determined that no permit was required for the deployment of these amendments. In accordance with the NMED conditional approvals, iron, manganese, and arsenic sampling in the treated water from extraction wells was completed, and the results were submitted in the quarterly monitoring reports under DP-1835. These results for CY 2022 Quarter 1 are provided in Table 2.2-2. No results for iron, manganese, or arsenic exceeded 90% of the numeric standards (900 µg/L, 180 µg/L, and 9 µg/L, respectively) as specified in 20.6.2.3103 NMAC.

DP-1835 Permit Condition No. 13 requires treated effluent to be analyzed annually for all water contaminants listed in 20.6.2.3103 NMAC and all toxic pollutants defined in 20.6.2.7.T(2) NMAC. The annual sample for CY 2022 is scheduled to be obtained during CY 2022 Quarter 3.

### 2.3 Quarterly Depth to Groundwater and Groundwater Quality Sampling Results (Requirement 3)

Depth to groundwater is expressed as the elevation of the groundwater above sea level. Figure 2.3-1 is the groundwater elevation map, and Table 2.3-1 provides the quarterly groundwater elevation measurements for a non-exhaustive selection of wells. An explanation of how the groundwater elevation map was generated is provided below. Quarterly groundwater analytical results from samples collected during CY 2022 Quarter 1 for the monitoring wells listed in Condition No. 14 are summarized in Table 2.3-2. It should be noted that some analytes reported in this table exceed their corresponding groundwater standard or screening level.

Sample results for total chromium, nitrate, perchlorate, sulfate, fluoride, chloride, or total dissolved solids numeric standards of 20.6.2.3103 NMAC or, for constituents not listed in 20.6.2.3103 NMAC, the numeric screening levels established for tap water in Table A-1 of the 2021 NMED "Risk Assessment Guidance for Site Investigations and Remediation Volume 1, Soil Screening Guidance for Human Health Risk Assessments" (NMED 2021). The values for these seven analytes are as follows:

- Chromium 50 µg/L
- Nitrate 10 mg/L
- Perchlorate 13.8 µg/L
- Sulfate 600 mg/L
- Fluoride 1.6 mg/L
- Chloride 250 mg/L
- Total dissolved solids 1000 mg/L

The regional aquifer beneath the Pajarito Plateau, on which Los Alamos National Laboratory (LANL or the Laboratory) is situated, is a complex hydrogeological system. The shape of the regional water table is predominantly controlled by the areas of recharge to the west (the flanks of the Sierra de los Valles and the Pajarito fault zone) and discharge to the east (the Rio Grande and the White Rock Canyon Springs). At a more local scale, such as the chromium plume area, the structure of the regional water table and groundwater flow is also expected to be influenced by

- local infiltration zones and recharge areas (e.g., beneath canyons),
- heterogeneity and anisotropy in the aquifer properties, and
- extraction and injection locations (municipal water-supply wells and chromium interim measure [IM] extraction/injection wells).

Table 2.2-2

**Treated Effluent Analytical Results Summary Table Related to Molasses and  
Sodium Dithionite Pilot Studies under NMED Conditional Approval – CY 2022 Quarter 1, DP-1835**

| Location ID | Sample ID      | Sample Date <sup>a</sup> | Parameter Name | Result | Report Unit | 90% of Standard or Screening Level | Lab Qualifier    | Detect Flag    | Filtered       | Method Detection Limit |
|-------------|----------------|--------------------------|----------------|--------|-------------|------------------------------------|------------------|----------------|----------------|------------------------|
| CTUA        | CTUA-22-235062 | 1/3/2022                 | Arsenic        | 2.29   | µg/L        | 9                                  | J <sup>b</sup>   | Y <sup>c</sup> | Y <sup>d</sup> | 2                      |
| CTUA        | CTUA-22-239608 | 1/11/2022                | Arsenic        | 2.79   | µg/L        | 9                                  | J                | Y              | Y              | 2                      |
| CTUA        | CTUA-22-239609 | 1/18/2022                | Arsenic        | 3.27   | µg/L        | 9                                  | J                | Y              | Y              | 2                      |
| CTUA        | CTUA-22-239610 | 1/24/2022                | Arsenic        | 2.44   | µg/L        | 9                                  | J                | Y              | Y              | 2                      |
| CTUA        | CTUA-22-239611 | 3/23/2022                | Arsenic        | 2      | µg/L        | 9                                  | U <sup>e</sup>   | N <sup>f</sup> | Y              | 2                      |
| CTUA        | CTUA-22-239612 | 3/28/2022                | Arsenic        | 2.77   | µg/L        | 9                                  | J                | Y              | Y              | 2                      |
| CTUC        | CTUC-22-235323 | 1/3/2022                 | Arsenic        | 2      | µg/L        | 9                                  | U                | N              | Y              | 2                      |
| CTUC        | CTUC-22-239622 | 1/11/2022                | Arsenic        | 2.63   | µg/L        | 9                                  | J                | Y              | Y              | 2                      |
| CTUC        | CTUC-22-239623 | 1/18/2022                | Arsenic        | 3.13   | µg/L        | 9                                  | J                | Y              | Y              | 2                      |
| CTUC        | CTUC-22-239624 | 1/24/2022                | Arsenic        | 6.75   | µg/L        | 9                                  | n/a <sup>g</sup> | Y              | Y              | 2                      |
| CTUC        | CTUC-22-239625 | 3/8/2022                 | Arsenic        | 2      | µg/L        | 9                                  | U                | N              | Y              | 2                      |
| CTUC        | CTUC-22-239627 | 3/16/2022                | Arsenic        | 2.21   | µg/L        | 9                                  | J                | Y              | Y              | 2                      |
| CTUC        | CTUC-22-239626 | 3/23/2022                | Arsenic        | 2      | µg/L        | 9                                  | U                | N              | Y              | 2                      |
| CTUC        | CTUC-22-239628 | 3/28/2022                | Arsenic        | 2.98   | µg/L        | 9                                  | J                | Y              | Y              | 2                      |
| CTUA        | CTUA-22-235062 | 1/3/2022                 | Iron           | 30     | µg/L        | 900                                | U                | N              | Y              | 30                     |
| CTUA        | CTUA-22-239608 | 1/11/2022                | Iron           | 30     | µg/L        | 900                                | U                | N              | Y              | 30                     |
| CTUA        | CTUA-22-239609 | 1/18/2022                | Iron           | 30     | µg/L        | 900                                | U                | N              | Y              | 30                     |
| CTUA        | CTUA-22-239610 | 1/24/2022                | Iron           | 33.3   | µg/L        | 900                                | J                | Y              | Y              | 30                     |
| CTUA        | CTUA-22-239611 | 3/23/2022                | Iron           | 30     | µg/L        | 900                                | U                | N              | Y              | 30                     |
| CTUA        | CTUA-22-239612 | 3/28/2022                | Iron           | 30     | µg/L        | 900                                | U                | N              | Y              | 30                     |
| CTUC        | CTUC-22-235323 | 1/3/2022                 | Iron           | 30     | µg/L        | 900                                | U                | N              | Y              | 30                     |
| CTUC        | CTUC-22-239622 | 1/11/2022                | Iron           | 30     | µg/L        | 900                                | U                | N              | Y              | 30                     |
| CTUC        | CTUC-22-239623 | 1/18/2022                | Iron           | 30     | µg/L        | 900                                | U                | N              | Y              | 30                     |
| CTUC        | CTUC-22-239624 | 1/24/2022                | Iron           | 42.2   | µg/L        | 900                                | J                | Y              | Y              | 30                     |
| CTUC        | CTUC-22-239625 | 3/8/2022                 | Iron           | 30     | µg/L        | 900                                | U                | N              | Y              | 30                     |

Table 2.2-2 (continued)

| Location ID | Sample ID      | Sample Date <sup>a</sup> | Parameter Name | Result | Report Unit | 90% of Standard or Screening Level | Lab Qualifier | Detect Flag | Filtered | Method Detection Limit |
|-------------|----------------|--------------------------|----------------|--------|-------------|------------------------------------|---------------|-------------|----------|------------------------|
| CTUC        | CTUC-22-239627 | 3/16/2022                | Iron           | 30     | µg/L        | 900                                | U             | N           | Y        | 30                     |
| CTUC        | CTUC-22-239626 | 3/23/2022                | Iron           | 30     | µg/L        | 900                                | U             | N           | Y        | 30                     |
| CTUC        | CTUC-22-239628 | 3/28/2022                | Iron           | 30     | µg/L        | 900                                | U             | N           | Y        | 30                     |
| CTUA        | CTUA-22-235062 | 1/3/2022                 | Manganese      | 2      | µg/L        | 180                                | U             | N           | Y        | 2                      |
| CTUA        | CTUA-22-239608 | 1/11/2022                | Manganese      | 2      | µg/L        | 180                                | U             | N           | Y        | 2                      |
| CTUA        | CTUA-22-239609 | 1/18/2022                | Manganese      | 2      | µg/L        | 180                                | U             | N           | Y        | 2                      |
| CTUA        | CTUA-22-239610 | 1/24/2022                | Manganese      | 2      | µg/L        | 180                                | U             | N           | Y        | 2                      |
| CTUA        | CTUA-22-239611 | 3/23/2022                | Manganese      | 8.29   | µg/L        | 180                                | J             | Y           | Y        | 2                      |
| CTUA        | CTUA-22-239612 | 3/28/2022                | Manganese      | 2      | µg/L        | 180                                | U             | N           | Y        | 2                      |
| CTUC        | CTUC-22-235323 | 1/3/2022                 | Manganese      | 2      | µg/L        | 180                                | U             | N           | Y        | 2                      |
| CTUC        | CTUC-22-239622 | 1/11/2022                | Manganese      | 2      | µg/L        | 180                                | U             | N           | Y        | 2                      |
| CTUC        | CTUC-22-239623 | 1/18/2022                | Manganese      | 2      | µg/L        | 180                                | U             | N           | Y        | 2                      |
| CTUC        | CTUC-22-239624 | 1/24/2022                | Manganese      | 2      | µg/L        | 180                                | U             | N           | Y        | 2                      |
| CTUC        | CTUC-22-239625 | 3/8/2022                 | Manganese      | 31.8   | µg/L        | 180                                | n/a           | Y           | Y        | 2                      |
| CTUC        | CTUC-22-239627 | 3/16/2022                | Manganese      | 2      | µg/L        | 180                                | U             | N           | Y        | 2                      |
| CTUC        | CTUC-22-239626 | 3/23/2022                | Manganese      | 9.48   | µg/L        | 180                                | J             | Y           | Y        | 2                      |
| CTUC        | CTUC-22-239628 | 3/28/2022                | Manganese      | 2      | µg/L        | 180                                | U             | N           | Y        | 2                      |

<sup>a</sup> In accordance with Condition No. 13 of DP-1835, analysis of the treated effluent from each IX unit is required only once every month for the CY 2022 Quarter 1 reporting period. All extraction wells, injection wells, and treatment units are turned off to perform maintenance on the system from 1/28/2022 to 3/8/2022.

<sup>b</sup> J = Analyte is classified as estimated.

<sup>c</sup> In the Detect Flag column, Y = detected.

<sup>d</sup> In the Filtered column, Y= filtered.

<sup>e</sup> U = Analyte is classified as not detected.

<sup>f</sup> N = No (not detected).

<sup>g</sup> n/a = Not applicable: no qualifiers applied.



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**Table 2.3-1**  
**Groundwater Elevations Summary for**  
**Groundwater Monitoring Wells – CY 2022 Quarter 1, DP-1835**

| Monitoring Well      | Groundwater Elevation <sup>a</sup><br>(ft) |
|----------------------|--------------------------------------------|
| CrPZ-1 (CrCH-1)      | 5831.538                                   |
| CrPZ-2a (CrCH-2a)    | 5830.323                                   |
| CrPZ-2b (CrCH-2b)    | 5829.749                                   |
| CrPZ-3 (CrCH-3)      | 5830.529                                   |
| CrPZ-4 (CrCH-4)      | 5831.436                                   |
| CrPZ-5 (CrCH-5)      | 5832.505                                   |
| R-11                 | 5830.541                                   |
| R-13                 | 5828.934                                   |
| R-43 S1 <sup>b</sup> | 5831.829                                   |
| R-43 S2 <sup>c</sup> | 5831.375                                   |
| R-44 S1              | 5829.76                                    |
| R-44 S2              | 5829.594                                   |
| R-45 S1              | 5829.627                                   |
| R-45 S2              | 5829.501                                   |
| R-50 S1              | 5830.896                                   |
| R-50 S2              | 5830.449                                   |
| R-61 S1              | 5831.508                                   |
| R-61 S2              | 5831.593                                   |
| R-62                 | 5834.272                                   |
| SIMR-2 <sup>d</sup>  | 5829.892                                   |

<sup>a</sup> Groundwater elevations provided are based on average February 2022 values from transducers. All extraction wells, injection wells, and treatment units are turned off to perform maintenance on the system.

<sup>b</sup> S1 = Screen 1.

<sup>c</sup> S2 = Screen 2.

<sup>d</sup> Fourth-quarter average November 2021 SIMR-2 data are reported here in accordance with the DP-1835 2021 Quarter 4 report (N3B 2022). Data were unavailable at the time of that report's preparation and are included in this report in accordance with the memorandum of agreement between San Ildefonso Pueblo and DOE. Data from the current quarter are not available at this time and will be presented in the next quarterly report.

Table 2.3-2

## Groundwater Monitoring Wells Analytical Results Summary Table – CY 2022 Quarter 1, DP-1835

| Field Sample ID | Location ID | Sample Date | Parameter Name              | Report Result | Report Unit | Standard or Screening Level | Lab Qualifier    | Detect Flag    | Filtered       | Method Detection Limit |
|-----------------|-------------|-------------|-----------------------------|---------------|-------------|-----------------------------|------------------|----------------|----------------|------------------------|
| CASA-22-238680  | R-11        | 01/21/2022  | Chloride                    | 3.87          | mg/L        | 250                         | n/a <sup>a</sup> | Y <sup>b</sup> | Y <sup>c</sup> | 0.200                  |
| CASA-22-238680  | R-11        | 01/21/2022  | Perchlorate                 | 0.781         | µg/L        | 13.8                        | n/a              | Y              | Y              | 0.200                  |
| CASA-22-238680  | R-11        | 01/21/2022  | Chromium                    | 13.6          | µg/L        | 50                          | n/a              | Y              | Y              | 10.0                   |
| CASA-22-238680  | R-11        | 01/21/2022  | Fluoride                    | 0.531         | mg/L        | 1.6                         | n/a              | Y              | Y              | 0.100                  |
| CASA-22-238680  | R-11        | 01/21/2022  | Nitrate-Nitrite as Nitrogen | 5.75          | mg/L        | 10                          | n/a              | Y              | Y              | 0.500                  |
| CASA-22-238680  | R-11        | 01/21/2022  | Sulfate                     | 9.49          | mg/L        | 600                         | n/a              | Y              | Y              | 0.400                  |
| CASA-22-238680  | R-11        | 01/21/2022  | Total Dissolved Solids      | 180           | mg/L        | 1000                        | n/a              | Y              | Y              | 14.3                   |
| CASA-22-239797  | R-11        | 02/14/2022  | Chloride                    | 3.92          | mg/L        | 250                         | n/a              | Y              | Y              | 0.200                  |
| CASA-22-239797  | R-11        | 02/14/2022  | Perchlorate                 | 0.765         | µg/L        | 13.8                        | n/a              | Y              | Y              | 0.200                  |
| CASA-22-239797  | R-11        | 02/14/2022  | Chromium                    | 12.5          | µg/L        | 50                          | n/a              | Y              | Y              | 10.0                   |
| CASA-22-239797  | R-11        | 02/14/2022  | Fluoride                    | 0.470         | mg/L        | 1.6                         | n/a              | Y              | Y              | 0.100                  |
| CASA-22-239797  | R-11        | 02/14/2022  | Nitrate-Nitrite as Nitrogen | 5.78          | mg/L        | 10                          | n/a              | Y              | Y              | 1.25                   |
| CASA-22-239797  | R-11        | 02/14/2022  | Sulfate                     | 9.30          | mg/L        | 600                         | n/a              | Y              | Y              | 0.400                  |
| CASA-22-239797  | R-11        | 02/14/2022  | Total Dissolved Solids      | 216           | mg/L        | 1000                        | n/a              | Y              | Y              | 14.3                   |
| CASA-22-243505  | R-11        | 03/21/2022  | Chloride                    | 3.82          | mg/L        | 250                         | n/a              | Y              | Y              | 0.200                  |
| CASA-22-243505  | R-11        | 03/21/2022  | Perchlorate                 | 0.753         | µg/L        | 13.8                        | n/a              | Y              | Y              | 0.200                  |
| CASA-22-243505  | R-11        | 03/21/2022  | Chromium                    | 11.6          | µg/L        | 50                          | n/a              | Y              | Y              | 10.0                   |
| CASA-22-243505  | R-11        | 03/21/2022  | Fluoride                    | 0.581         | mg/L        | 1.6                         | n/a              | Y              | Y              | 0.100                  |
| CASA-22-243505  | R-11        | 03/21/2022  | Nitrate-Nitrite as Nitrogen | 5.83          | mg/L        | 10                          | n/a              | Y              | Y              | 0.500                  |
| CASA-22-243505  | R-11        | 03/21/2022  | Sulfate                     | 9.55          | mg/L        | 600                         | n/a              | Y              | Y              | 0.400                  |
| CASA-22-243505  | R-11        | 03/21/2022  | Total Dissolved Solids      | 179           | mg/L        | 1000                        | n/a              | Y              | Y              | 14.3                   |
| CAMO-22-238556  | R-13        | 01/28/2022  | Chloride                    | 2.70          | mg/L        | 250                         | n/a              | Y              | Y              | 0.200                  |
| CAMO-22-238556  | R-13        | 01/28/2022  | Perchlorate                 | 0.402         | µg/L        | 13.8                        | n/a              | Y              | Y              | 0.200                  |
| CAMO-22-238556  | R-13        | 01/28/2022  | Chromium                    | 4.38          | µg/L        | 50                          | J <sup>d</sup>   | Y              | Y              | 10.0                   |
| CAMO-22-238556  | R-13        | 01/28/2022  | Fluoride                    | 0.294         | mg/L        | 1.6                         | n/a              | Y              | Y              | 0.100                  |

Table 2.3-2 (continued)

| Field Sample ID | Location ID          | Sample Date | Parameter Name              | Report Result | Report Unit | Standard or Screening Level | Lab Qualifier | Detect Flag    | Filtered | Method Detection Limit |
|-----------------|----------------------|-------------|-----------------------------|---------------|-------------|-----------------------------|---------------|----------------|----------|------------------------|
| CAMO-22-238556  | R-13                 | 01/28/2022  | Nitrate-Nitrite as Nitrogen | 0.850         | mg/L        | 10                          | n/a           | Y              | Y        | 0.250                  |
| CAMO-22-238556  | R-13                 | 01/28/2022  | Sulfate                     | 3.44          | mg/L        | 600                         | n/a           | Y              | Y        | 0.400                  |
| CAMO-22-238556  | R-13                 | 01/28/2022  | Total Dissolved Solids      | 111           | mg/L        | 1000                        | n/a           | Y              | Y        | 14.3                   |
| CASA-22-238693  | R-43 S1 <sup>e</sup> | 01/27/2022  | Chloride                    | 7.69          | mg/L        | 250                         | n/a           | Y              | Y        | 0.200                  |
| CASA-22-238693  | R-43 S1              | 01/27/2022  | Perchlorate                 | 0.744         | µg/L        | 13.8                        | n/a           | Y              | Y        | 0.200                  |
| CASA-22-238693  | R-43 S1              | 01/27/2022  | Chromium                    | 201           | µg/L        | 50                          | n/a           | Y              | Y        | 10.0                   |
| CASA-22-238693  | R-43 S1              | 01/27/2022  | Fluoride                    | 0.350         | mg/L        | 1.6                         | n/a           | N <sup>f</sup> | Y        | 0.100                  |
| CASA-22-238693  | R-43 S1              | 01/27/2022  | Nitrate-Nitrite as Nitrogen | 4.99          | mg/L        | 10                          | n/a           | Y              | Y        | 0.500                  |
| CASA-22-238693  | R-43 S1              | 01/27/2022  | Sulfate                     | 16.7          | mg/L        | 600                         | n/a           | Y              | Y        | 0.400                  |
| CASA-22-238693  | R-43 S1              | 01/27/2022  | Total Dissolved Solids      | 144           | mg/L        | 1000                        | n/a           | Y              | Y        | 14.3                   |
| CASA-22-238695  | R-43 S2 <sup>g</sup> | 01/25/2022  | Chloride                    | 7.24          | mg/L        | 250                         | n/a           | Y              | Y        | 0.200                  |
| CASA-22-238695  | R-43 S2              | 01/25/2022  | Perchlorate                 | 0.876         | µg/L        | 13.8                        | n/a           | Y              | Y        | 0.200                  |
| CASA-22-238695  | R-43 S2              | 01/25/2022  | Chromium                    | 39.1          | µg/L        | 50                          | n/a           | Y              | Y        | 10.0                   |
| CASA-22-238695  | R-43 S2              | 01/25/2022  | Fluoride                    | 0.446         | mg/L        | 1.6                         | n/a           | Y              | Y        | 0.100                  |
| CASA-22-238695  | R-43 S2              | 01/25/2022  | Nitrate-Nitrite as Nitrogen | 3.80          | mg/L        | 10                          | n/a           | Y              | Y        | 0.250                  |
| CASA-22-238695  | R-43 S2              | 01/25/2022  | Sulfate                     | 10.7          | mg/L        | 600                         | n/a           | Y              | Y        | 0.400                  |
| CASA-22-238695  | R-43 S2              | 01/25/2022  | Total Dissolved Solids      | 196           | mg/L        | 1000                        | n/a           | Y              | Y        | 14.3                   |
| CAMO-22-238631  | R-44 S1              | 01/20/2022  | Chloride                    | 21.3          | mg/L        | 250                         | n/a           | Y              | Y        | 1.00                   |
| CAMO-22-238631  | R-44 S1              | 01/20/2022  | Perchlorate                 | 0.431         | µg/L        | 13.8                        | n/a           | Y              | Y        | 0.200                  |
| CAMO-22-238631  | R-44 S1              | 01/20/2022  | Total Dissolved Solids      | 193           | mg/L        | 1000                        | n/a           | Y              | Y        | 14.3                   |
| CAMO-22-238631  | R-44 S1              | 01/20/2022  | Chromium                    | 3.82          | µg/L        | 50                          | J             | Y              | Y        | 10.0                   |
| CAMO-22-238631  | R-44 S1              | 01/20/2022  | Sulfate                     | 21.3          | mg/L        | 600                         | n/a           | Y              | Y        | 0.800                  |
| CAMO-22-238631  | R-44 S1              | 01/20/2022  | Fluoride                    | 0.296         | mg/L        | 1.6                         | n/a           | Y              | Y        | 0.100                  |
| CAMO-22-238631  | R-44 S1              | 01/20/2022  | Nitrate-Nitrite as Nitrogen | 2.66          | mg/L        | 10                          | n/a           | Y              | Y        | 0.500                  |
| CAMO-22-239809  | R-44 S1              | 02/18/2022  | Chloride                    | 19.6          | mg/L        | 250                         | n/a           | Y              | Y        | 1.00                   |
| CAMO-22-239809  | R-44 S1              | 02/18/2022  | Total Dissolved Solids      | 224           | mg/L        | 1000                        | n/a           | Y              | Y        | 14.3                   |
| CAMO-22-239809  | R-44 S1              | 02/18/2022  | Perchlorate                 | 0.417         | µg/L        | 13.8                        | n/a           | Y              | Y        | 0.200                  |

Table 2.3-2 (continued)

| Field Sample ID | Location ID | Sample Date | Parameter Name              | Report Result | Report Unit | Standard or Screening Level | Lab Qualifier | Detect Flag | Filtered | Method Detection Limit |
|-----------------|-------------|-------------|-----------------------------|---------------|-------------|-----------------------------|---------------|-------------|----------|------------------------|
| CAMO-22-239809  | R-44 S1     | 02/18/2022  | Chromium                    | 3.03          | µg/L        | 50                          | J             | Y           | Y        | 10.0                   |
| CAMO-22-239809  | R-44 S1     | 02/18/2022  | Sulfate                     | 19.2          | mg/L        | 600                         | n/a           | Y           | Y        | 2.00                   |
| CAMO-22-239809  | R-44 S1     | 02/18/2022  | Fluoride                    | 0.161         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-239809  | R-44 S1     | 02/18/2022  | Nitrate-Nitrite as Nitrogen | 2.72          | mg/L        | 10                          | n/a           | Y           | Y        | 0.500                  |
| CAMO-22-243518  | R-44 S1     | 03/17/2022  | Nitrate-Nitrite as Nitrogen | 2.76          | mg/L        | 10                          | n/a           | Y           | Y        | 0.500                  |
| CAMO-22-243518  | R-44 S1     | 03/17/2022  | Fluoride                    | 0.300         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-243518  | R-44 S1     | 03/17/2022  | Chromium                    | 3.49          | µg/L        | 50                          | J             | Y           | Y        | 10.0                   |
| CAMO-22-243518  | R-44 S1     | 03/17/2022  | Sulfate                     | 20.0          | mg/L        | 600                         | n/a           | Y           | Y        | 2.00                   |
| CAMO-22-243518  | R-44 S1     | 03/17/2022  | Perchlorate                 | 0.417         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-243518  | R-44 S1     | 03/17/2022  | Total Dissolved Solids      | 229           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-243518  | R-44 S1     | 03/17/2022  | Chloride                    | 20.6          | mg/L        | 250                         | n/a           | Y           | Y        | 1.00                   |
| CAMO-22-238634  | R-44 S2     | 01/20/2022  | Chloride                    | 2.65          | mg/L        | 250                         | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-238634  | R-44 S2     | 01/20/2022  | Total Dissolved Solids      | 134           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-238634  | R-44 S2     | 01/20/2022  | Perchlorate                 | 0.360         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-238634  | R-44 S2     | 01/20/2022  | Sulfate                     | 3.10          | mg/L        | 600                         | n/a           | Y           | Y        | 0.400                  |
| CAMO-22-238634  | R-44 S2     | 01/20/2022  | Chromium                    | 10.3          | µg/L        | 50                          | n/a           | Y           | Y        | 10.0                   |
| CAMO-22-238634  | R-44 S2     | 01/20/2022  | Nitrate-Nitrite as Nitrogen | 0.925         | mg/L        | 10                          | n/a           | Y           | Y        | 0.250                  |
| CAMO-22-238634  | R-44 S2     | 01/20/2022  | Fluoride                    | 0.475         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-239812  | R-44 S2     | 02/17/2022  | Total Dissolved Solids      | 136           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-239812  | R-44 S2     | 02/17/2022  | Sulfate                     | 2.96          | mg/L        | 600                         | n/a           | Y           | Y        | 0.400                  |
| CAMO-22-239812  | R-44 S2     | 02/17/2022  | Nitrate-Nitrite as Nitrogen | 0.910         | mg/L        | 10                          | n/a           | Y           | Y        | 0.250                  |
| CAMO-22-239812  | R-44 S2     | 02/17/2022  | Fluoride                    | 0.369         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-239812  | R-44 S2     | 02/17/2022  | Chromium                    | 9.75          | µg/L        | 50                          | J             | Y           | Y        | 10.0                   |
| CAMO-22-239812  | R-44 S2     | 02/17/2022  | Perchlorate                 | 0.365         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-239812  | R-44 S2     | 02/17/2022  | Chloride                    | 2.51          | mg/L        | 250                         | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-243521  | R-44 S2     | 03/17/2022  | Fluoride                    | 0.426         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-243521  | R-44 S2     | 03/17/2022  | Chromium                    | 9.50          | µg/L        | 50                          | J             | Y           | Y        | 10.0                   |

Table 2.3-2 (continued)

| Field Sample ID | Location ID | Sample Date | Parameter Name              | Report Result | Report Unit | Standard or Screening Level | Lab Qualifier | Detect Flag | Filtered | Method Detection Limit |
|-----------------|-------------|-------------|-----------------------------|---------------|-------------|-----------------------------|---------------|-------------|----------|------------------------|
| CAMO-22-243521  | R-44 S2     | 03/17/2022  | Nitrate-Nitrite as Nitrogen | 0.877         | mg/L        | 10                          | n/a           | Y           | Y        | 0.0500                 |
| CAMO-22-243521  | R-44 S2     | 03/17/2022  | Perchlorate                 | 0.354         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-243521  | R-44 S2     | 03/17/2022  | Sulfate                     | 3.05          | mg/L        | 600                         | n/a           | Y           | Y        | 0.400                  |
| CAMO-22-243521  | R-44 S2     | 03/17/2022  | Chloride                    | 2.73          | mg/L        | 250                         | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-243521  | R-44 S2     | 03/17/2022  | Total Dissolved Solids      | 144           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-238637  | R-45 S1     | 01/13/2022  | Chloride                    | 18.9          | mg/L        | 250                         | n/a           | Y           | Y        | 1.00                   |
| CAMO-22-238637  | R-45 S1     | 01/13/2022  | Perchlorate                 | 0.478         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-238637  | R-45 S1     | 01/13/2022  | Chromium                    | 4.60          | µg/L        | 50                          | J             | Y           | Y        | 10.0                   |
| CAMO-22-238637  | R-45 S1     | 01/13/2022  | Fluoride                    | 0.311         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-238637  | R-45 S1     | 01/13/2022  | Nitrate-Nitrite as Nitrogen | 3.11          | mg/L        | 10                          | n/a           | Y           | Y        | 0.500                  |
| CAMO-22-238637  | R-45 S1     | 01/13/2022  | Sulfate                     | 19.0          | mg/L        | 600                         | n/a           | Y           | Y        | 2.00                   |
| CAMO-22-238637  | R-45 S1     | 01/13/2022  | Total Dissolved Solids      | 203           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-239821  | R-45 S1     | 02/23/2022  | Total Dissolved Solids      | 227           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-239821  | R-45 S1     | 02/23/2022  | Sulfate                     | 20.4          | mg/L        | 600                         | n/a           | Y           | Y        | 2.00                   |
| CAMO-22-239821  | R-45 S1     | 02/23/2022  | Nitrate-Nitrite as Nitrogen | 3.18          | mg/L        | 10                          | n/a           | Y           | Y        | 0.250                  |
| CAMO-22-239821  | R-45 S1     | 02/23/2022  | Fluoride                    | 0.272         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-239821  | R-45 S1     | 02/23/2022  | Chromium                    | 3.09          | µg/L        | 50                          | J             | Y           | Y        | 10.0                   |
| CAMO-22-239821  | R-45 S1     | 02/23/2022  | Perchlorate                 | 0.488         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-239821  | R-45 S1     | 02/23/2022  | Chloride                    | 20.4          | mg/L        | 250                         | n/a           | Y           | Y        | 1.00                   |
| CAMO-22-243524  | R-45 S1     | 03/23/2022  | Chloride                    | 21.5          | mg/L        | 250                         | n/a           | Y           | Y        | 1.00                   |
| CAMO-22-243524  | R-45 S1     | 03/23/2022  | Perchlorate                 | 0.509         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-243524  | R-45 S1     | 03/23/2022  | Chromium                    | 3.02          | µg/L        | 50                          | J             | Y           | Y        | 10.0                   |
| CAMO-22-243524  | R-45 S1     | 03/23/2022  | Fluoride                    | 0.310         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-243524  | R-45 S1     | 03/23/2022  | Nitrate-Nitrite as Nitrogen | 3.26          | mg/L        | 10                          | n/a           | Y           | Y        | 0.250                  |
| CAMO-22-243524  | R-45 S1     | 03/23/2022  | Sulfate                     | 21.4          | mg/L        | 600                         | n/a           | Y           | Y        | 2.00                   |
| CAMO-22-243524  | R-45 S1     | 03/23/2022  | Total Dissolved Solids      | 233           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-238640  | R-45 S2     | 01/26/2022  | Total Dissolved Solids      | 171           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |

Table 2.3-2 (continued)

| Field Sample ID | Location ID | Sample Date | Parameter Name              | Report Result | Report Unit | Standard or Screening Level | Lab Qualifier | Detect Flag | Filtered | Method Detection Limit |
|-----------------|-------------|-------------|-----------------------------|---------------|-------------|-----------------------------|---------------|-------------|----------|------------------------|
| CAMO-22-238640  | R-45 S2     | 01/26/2022  | Chloride                    | 7.35          | mg/L        | 250                         | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-238640  | R-45 S2     | 01/26/2022  | Perchlorate                 | 0.468         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-238640  | R-45 S2     | 01/26/2022  | Chromium                    | 63.0          | µg/L        | 50                          | n/a           | Y           | Y        | 10.0                   |
| CAMO-22-238640  | R-45 S2     | 01/26/2022  | Sulfate                     | 9.14          | mg/L        | 600                         | n/a           | Y           | Y        | 0.400                  |
| CAMO-22-238640  | R-45 S2     | 01/26/2022  | Nitrate-Nitrite as Nitrogen | 1.38          | mg/L        | 10                          | n/a           | Y           | Y        | 0.0500                 |
| CAMO-22-238640  | R-45 S2     | 01/26/2022  | Fluoride                    | 0.312         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-239825  | R-45 S2     | 02/23/2022  | Chloride                    | 6.91          | mg/L        | 250                         | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-239825  | R-45 S2     | 02/23/2022  | Perchlorate                 | 0.473         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-239825  | R-45 S2     | 02/23/2022  | Chromium                    | 54.3          | µg/L        | 50                          | n/a           | Y           | Y        | 10.0                   |
| CAMO-22-239825  | R-45 S2     | 02/23/2022  | Fluoride                    | 0.363         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-239825  | R-45 S2     | 02/23/2022  | Nitrate-Nitrite as Nitrogen | 1.42          | mg/L        | 10                          | n/a           | Y           | Y        | 0.250                  |
| CAMO-22-239825  | R-45 S2     | 02/23/2022  | Sulfate                     | 8.70          | mg/L        | 600                         | n/a           | Y           | Y        | 0.400                  |
| CAMO-22-239825  | R-45 S2     | 02/23/2022  | Total Dissolved Solids      | 166           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-243527  | R-45 S2     | 03/23/2022  | Chloride                    | 7.40          | mg/L        | 250                         | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-243527  | R-45 S2     | 03/23/2022  | Perchlorate                 | 0.490         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-243527  | R-45 S2     | 03/23/2022  | Chromium                    | 57.6          | µg/L        | 50                          | n/a           | Y           | Y        | 10.0                   |
| CAMO-22-243527  | R-45 S2     | 03/23/2022  | Fluoride                    | 0.403         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-243527  | R-45 S2     | 03/23/2022  | Nitrate-Nitrite as Nitrogen | 1.38          | mg/L        | 10                          | n/a           | Y           | Y        | 0.0500                 |
| CAMO-22-243527  | R-45 S2     | 03/23/2022  | Sulfate                     | 9.12          | mg/L        | 600                         | n/a           | Y           | Y        | 0.400                  |
| CAMO-22-243527  | R-45 S2     | 03/23/2022  | Total Dissolved Solids      | 180           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-238643  | R-50 S1     | 01/11/2022  | Chloride                    | 20.8          | mg/L        | 250                         | n/a           | Y           | Y        | 1.00                   |
| CAMO-22-238643  | R-50 S1     | 01/11/2022  | Perchlorate                 | 0.421         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-238643  | R-50 S1     | 01/11/2022  | Chromium                    | 11.4          | µg/L        | 50                          | n/a           | Y           | Y        | 10.0                   |
| CAMO-22-238643  | R-50 S1     | 01/11/2022  | Fluoride                    | 0.351         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-238643  | R-50 S1     | 01/11/2022  | Nitrate-Nitrite as Nitrogen | 2.92          | mg/L        | 10                          | n/a           | Y           | Y        | 0.250                  |
| CAMO-22-238643  | R-50 S1     | 01/11/2022  | Sulfate                     | 19.8          | mg/L        | 600                         | n/a           | Y           | Y        | 2.00                   |
| CAMO-22-238643  | R-50 S1     | 01/11/2022  | Total Dissolved Solids      | 210           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |

Table 2.3-2 (continued)

| Field Sample ID | Location ID | Sample Date | Parameter Name              | Report Result | Report Unit | Standard or Screening Level | Lab Qualifier | Detect Flag | Filtered | Method Detection Limit |
|-----------------|-------------|-------------|-----------------------------|---------------|-------------|-----------------------------|---------------|-------------|----------|------------------------|
| CAMO-22-239815  | R-50 S1     | 02/22/2022  | Chloride                    | 21.0          | mg/L        | 250                         | n/a           | Y           | Y        | 1.00                   |
| CAMO-22-239815  | R-50 S1     | 02/22/2022  | Perchlorate                 | 0.420         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-239815  | R-50 S1     | 02/22/2022  | Chromium                    | 10.4          | µg/L        | 50                          | n/a           | Y           | Y        | 10.0                   |
| CAMO-22-239815  | R-50 S1     | 02/22/2022  | Fluoride                    | 0.247         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-239815  | R-50 S1     | 02/22/2022  | Nitrate-Nitrite as Nitrogen | 2.98          | mg/L        | 10                          | n/a           | Y           | Y        | 0.500                  |
| CAMO-22-239815  | R-50 S1     | 02/22/2022  | Sulfate                     | 20.1          | mg/L        | 600                         | n/a           | Y           | Y        | 2.00                   |
| CAMO-22-239815  | R-50 S1     | 02/22/2022  | Total Dissolved Solids      | 219           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-243530  | R-50 S1     | 03/22/2022  | Total Dissolved Solids      | 237           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-243530  | R-50 S1     | 03/22/2022  | Sulfate                     | 20.8          | mg/L        | 600                         | n/a           | Y           | Y        | 2.00                   |
| CAMO-22-243530  | R-50 S1     | 03/22/2022  | Nitrate-Nitrite as Nitrogen | 2.96          | mg/L        | 10                          | n/a           | Y           | Y        | 0.500                  |
| CAMO-22-243530  | R-50 S1     | 03/22/2022  | Fluoride                    | 0.273         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-243530  | R-50 S1     | 03/22/2022  | Chromium                    | 11.0          | µg/L        | 50                          | n/a           | Y           | Y        | 10.0                   |
| CAMO-22-243530  | R-50 S1     | 03/22/2022  | Perchlorate                 | 0.418         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-243530  | R-50 S1     | 03/22/2022  | Chloride                    | 21.9          | mg/L        | 250                         | n/a           | Y           | Y        | 1.00                   |
| CAMO-22-238646  | R-50 S2     | 01/24/2022  | Chloride                    | 2.23          | mg/L        | 250                         | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-238646  | R-50 S2     | 01/24/2022  | Perchlorate                 | 0.320         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-238646  | R-50 S2     | 01/24/2022  | Chromium                    | 4.83          | µg/L        | 50                          | J             | Y           | Y        | 10.0                   |
| CAMO-22-238646  | R-50 S2     | 01/24/2022  | Fluoride                    | 0.449         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-238646  | R-50 S2     | 01/24/2022  | Nitrate-Nitrite as Nitrogen | 0.580         | mg/L        | 10                          | n/a           | Y           | Y        | 0.0500                 |
| CAMO-22-238646  | R-50 S2     | 01/24/2022  | Sulfate                     | 2.57          | mg/L        | 600                         | n/a           | Y           | Y        | 0.400                  |
| CAMO-22-238646  | R-50 S2     | 01/24/2022  | Total Dissolved Solids      | 150           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-239818  | R-50 S2     | 02/22/2022  | Total Dissolved Solids      | 124           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-239818  | R-50 S2     | 02/22/2022  | Sulfate                     | 2.41          | mg/L        | 600                         | n/a           | Y           | Y        | 0.400                  |
| CAMO-22-239818  | R-50 S2     | 02/22/2022  | Nitrate-Nitrite as Nitrogen | 0.585         | mg/L        | 10                          | n/a           | Y           | Y        | 0.250                  |
| CAMO-22-239818  | R-50 S2     | 02/22/2022  | Fluoride                    | 0.436         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-239818  | R-50 S2     | 02/22/2022  | Chromium                    | 4.32          | µg/L        | 50                          | J             | Y           | Y        | 10.0                   |
| CAMO-22-239818  | R-50 S2     | 02/22/2022  | Perchlorate                 | 0.336         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |

Table 2.3-2 (continued)

| Field Sample ID | Location ID         | Sample Date | Parameter Name              | Report Result | Report Unit | Standard or Screening Level | Lab Qualifier | Detect Flag | Filtered | Method Detection Limit |
|-----------------|---------------------|-------------|-----------------------------|---------------|-------------|-----------------------------|---------------|-------------|----------|------------------------|
| CAMO-22-239818  | R-50 S2             | 02/22/2022  | Chloride                    | 2.06          | mg/L        | 250                         | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-243535  | R-50 S2             | 03/22/2022  | Chloride                    | 2.28          | mg/L        | 250                         | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-243535  | R-50 S2             | 03/22/2022  | Perchlorate                 | 0.337         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-243535  | R-50 S2             | 03/22/2022  | Chromium                    | 4.35          | µg/L        | 50                          | J             | Y           | Y        | 10.0                   |
| CAMO-22-243535  | R-50 S2             | 03/22/2022  | Fluoride                    | 0.418         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-243535  | R-50 S2             | 03/22/2022  | Nitrate-Nitrite as Nitrogen | 0.605         | mg/L        | 10                          | n/a           | Y           | Y        | 0.0500                 |
| CAMO-22-243535  | R-50 S2             | 03/22/2022  | Sulfate                     | 2.58          | mg/L        | 600                         | n/a           | Y           | Y        | 0.400                  |
| CAMO-22-243535  | R-50 S2             | 03/22/2022  | Total Dissolved Solids      | 166           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-238662  | R-62                | 01/25/2022  | Chloride                    | 19.7          | mg/L        | 250                         | n/a           | Y           | Y        | 1.00                   |
| CAMO-22-238662  | R-62                | 01/25/2022  | Perchlorate                 | 0.902         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-238662  | R-62                | 01/25/2022  | Chromium                    | 351           | µg/L        | 50                          | n/a           | Y           | Y        | 10.0                   |
| CAMO-22-238662  | R-62                | 01/25/2022  | Fluoride                    | 0.224         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-238662  | R-62                | 01/25/2022  | Nitrate-Nitrite as Nitrogen | 2.29          | mg/L        | 10                          | n/a           | Y           | Y        | 0.250                  |
| CAMO-22-238662  | R-62                | 01/25/2022  | Sulfate                     | 33.7          | mg/L        | 600                         | n/a           | Y           | Y        | 2.00                   |
| CAMO-22-238662  | R-62                | 01/25/2022  | Total Dissolved Solids      | 221           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-235042  | SIMR-2 <sup>h</sup> | 10/22/2021  | Chloride                    | 2.14          | mg/L        | 250                         | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-235042  | SIMR-2              | 10/22/2021  | Perchlorate                 | 0.499         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-235042  | SIMR-2              | 10/22/2021  | Chromium                    | 4.66          | µg/L        | 50                          | J             | Y           | Y        | 10.0                   |
| CAMO-22-235042  | SIMR-2              | 10/22/2021  | Fluoride                    | 0.517         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-235042  | SIMR-2              | 10/22/2021  | Nitrate-Nitrite as Nitrogen | 0.801         | mg/L        | 10                          | n/a           | Y           | Y        | 0.0500                 |
| CAMO-22-235042  | SIMR-2              | 10/22/2021  | Sulfate                     | 2.70          | mg/L        | 600                         | n/a           | Y           | Y        | 0.400                  |
| CAMO-22-235042  | SIMR-2              | 10/22/2021  | Total Dissolved Solids      | 133           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-236404  | SIMR-2              | 11/05/2021  | Chloride                    | 2.16          | mg/L        | 250                         | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-236404  | SIMR-2              | 11/05/2021  | Perchlorate                 | 0.489         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-236404  | SIMR-2              | 11/05/2021  | Chromium                    | 5.04          | µg/L        | 50                          | J             | Y           | Y        | 10.0                   |
| CAMO-22-236404  | SIMR-2              | 11/05/2021  | Fluoride                    | 0.352         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-236404  | SIMR-2              | 11/05/2021  | Nitrate-Nitrite as Nitrogen | 0.863         | mg/L        | 10                          | n/a           | Y           | Y        | 0.0500                 |

Table 2.3-2 (continued)

| Field Sample ID | Location ID | Sample Date | Parameter Name              | Report Result | Report Unit | Standard or Screening Level | Lab Qualifier | Detect Flag | Filtered | Method Detection Limit |
|-----------------|-------------|-------------|-----------------------------|---------------|-------------|-----------------------------|---------------|-------------|----------|------------------------|
| CAMO-22-236404  | SIMR-2      | 11/05/2021  | Sulfate                     | 2.64          | mg/L        | 600                         | n/a           | Y           | Y        | 0.400                  |
| CAMO-22-236404  | SIMR-2      | 11/05/2021  | Total Dissolved Solids      | 133           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |
| CAMO-22-237821  | SIMR-2      | 12/09/2021  | Chloride                    | 2.40          | mg/L        | 250                         | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-237821  | SIMR-2      | 12/09/2021  | Perchlorate                 | 0.524         | µg/L        | 13.8                        | n/a           | Y           | Y        | 0.200                  |
| CAMO-22-237821  | SIMR-2      | 12/09/2021  | Chromium                    | 5.42          | µg/L        | 50                          | J             | Y           | Y        | 10.0                   |
| CAMO-22-237821  | SIMR-2      | 12/09/2021  | Fluoride                    | 0.351         | mg/L        | 1.6                         | n/a           | Y           | Y        | 0.100                  |
| CAMO-22-237821  | SIMR-2      | 12/09/2021  | Nitrate-Nitrite as Nitrogen | 0.780         | mg/L        | 10                          | n/a           | Y           | Y        | 0.250                  |
| CAMO-22-237821  | SIMR-2      | 12/09/2021  | Sulfate                     | 2.81          | mg/L        | 600                         | n/a           | Y           | Y        | 0.400                  |
| CAMO-22-237821  | SIMR-2      | 12/09/2021  | Total Dissolved Solids      | 133           | mg/L        | 1000                        | n/a           | Y           | Y        | 14.3                   |

<sup>a</sup> n/a = Not applicable: no qualifiers applied.

<sup>b</sup> In the Detect Flag column, Y = detected.

<sup>c</sup> In the Filtered column, Y = filtered.

<sup>d</sup> J = Analyte is classified as estimated.

<sup>e</sup> S1 = Screen 1.

<sup>f</sup> N = No (not detected).

<sup>g</sup> S2 = Screen 2.

<sup>h</sup> SIMR-2 data are reported here in accordance with the memorandum of agreement and protocol agreement between San Ildefonso Pueblo and DOE.

Long-term water-level data, contaminant transport observations (travel times and direction of migration), and calibrated model results are lines of evidence that suggest that the water table was relatively flat in the area of the chromium plume before the implementation of CrEX extraction and CrIN injection wells. Steeper gradients are found to the west (far outside of the boundary depicted in Figure 2.3-1) because of the mountain-front recharge, and to the east toward the Rio Grande. The low ambient gradient in the chromium plume area could be related to any or all of the following:

- the relatively high permeability of the Puye Formation and Miocene pumiceous sediments
- anisotropy of the regional aquifer
- localized recharge along the canyons above the regional aquifer, faults, or other lineaments that affect regional-scale hydraulic conductivity

nearby water-supply pumping Although it is difficult to infer absolute groundwater flow directions from the relatively flat contours in the chromium plume area, the general flow of groundwater can be determined. Groundwater elevation data and contaminant transport observations indicated that prior to operation of the IM, the groundwater flowed generally toward the east-southeast. The current groundwater flows generally towards the southeast, with the influence of IM operations being seen mainly in the vicinity of the extraction wells CrEX-1, CrEX-2, CrEX-3, and CrEX-4. Local flow direction near these wells is inward due to the extraction-induced depression in potentiometric surface.

Water table elevations in the chromium plume area can vary temporally as a result of transient effects that include injection into, and extraction from, the chromium IM infrastructure wells, and pumping of Los Alamos County's water-supply wells. This is discussed for the case of CY 2022 Quarter 1 below.

Effects on flow direction from water-supply pumping are small compared with the local effects of extraction and injection at chromium IM wells. Transience in the water levels at time scale of hours to days observed at the monitoring wells within the plume area does not appear to be substantially affected by the water-supply pumping at the nearby production wells (PM-2, PM-3, PM-4, PM-5, and O-4) (LANL 2009). Impacts of production well pumping are observed over seasonal to yearly time scales, and overall have led to a fairly uniform decline in the water table across the plume area, in contrast to IM extraction and injection impacts.

A long-term decline of approximately 0.2 to 0.5 ft/yr in the regional water levels has been observed throughout the aquifer beneath the Pajarito Plateau. The decline could be caused by long-term changes in the aquifer recharge and discharge conditions. Because of the long-term declines and pumping transience described above, the water-level data and the respective water table contour maps are variable over time; each map therefore represents a specific period of time. Figure 2.3-1 depicts the average water-level data and water table contours for February 2022. General flow direction is indicated by the vector.

To generate this quarterly contour map, average water levels are calculated using values from the middle month of the 3-month reporting period. Monitoring wells within and surrounding the plume are used, including wells not presented on the map (e.g., R-21, R-31, R-32, R-37, and R-40) or in Table 2.3-1. Water levels in wells surrounding the plume provide useful control points for contouring along the edges of the area of interest for this report. Only water levels measured at well screens near the water table are used for contouring.

Simple interpolation methods for water table data from a complex heterogeneous site could produce maps that do not represent physically realistic hydrological systems. This water table map is contoured by incorporating process knowledge of groundwater hydraulics (e.g., flownet conformity rules) as well as

conceptual models of groundwater flow in the project area as described above. Key inputs to the conceptual model include knowledge of long-term operations of extraction and injection wells, water-level elevations in monitoring wells near extraction and injection points, and cross-hole tracer data between injection wells and monitoring wells.

Because of the spatial coverage of wells and piezometers and the regional structure of significantly steeper gradients to the east and west of the chromium plume area, surrounding wells (e.g., R-21, R-31, R-32, R-37, and R-40) and control points based on expert opinion are used to provide estimated water-level elevations in areas that do not have sufficient data to provide constraints. As additional analysis is performed using historical and developing data sets from existing wells and data that will be collected from proposed wells, the use of these control points is being reanalyzed, adjusted, or discontinued based on additional supporting data and contouring methods.

Over the course of operating the chromium IM system, changes to water table elevation occur depending upon how the system has been operating. A quarter-by-quarter account of the water table elevations is not provided as part of this quarterly report. Each quarterly report previously submitted provides information of the water table elevation near the chromium IM wells along with possible causes for water level variations for that specific quarter. Information on the quarterly depth to groundwater for the CY 2022 Quarter 1 is provided below.

In the current reporting period of CY 2022 Quarter 1, IM pumping was fairly steady through most of January, and intermittent in March. No injection or extraction occurred in February, which is the middle month of Quarter 1. The IM had been operating at near capacity for the previous 1.5 yr, and data from some wells suggest aquifer recovery from pumping and injection during this period. Figure 2.3-1 was generated using data from February 2022. Compared to prior quarters, water levels are relatively lower at R-50 screen 1 compared to nearby wells during CY 2022 Quarter 1, possibly related to quiescence at the nearby injection wells, CrIN-3, -4, and -5. Also, water levels are relatively higher at locations adjacent to extraction wells, likely a result of the pause in extraction (e.g., CrPZ-1, CrPZ-3, R-28, and R-70). Water-level increases are also apparent at R-15 and R-62, which are generally considered upstream of the IM influence. These effects are probably a result of pumping activity at nearby county wells.

## 2.4 Any Operations/Maintenance Activities Performed (Requirement 4)

Extraction, treatment, and injection operations continued during CY 2022 Quarter 1. Operations and maintenance activities completed during CY 2022 Quarter 1 are listed in Table 2.4-1 for the extraction, treatment, and injection system.

**Table 2.4-1**  
**Operations and Maintenance Activity Summary Table – CY 2022 Quarter 1**

| Maintenance Date            | Elements Impacted                                                                | Operation/Maintenance Description                                                                                                                                                                  |
|-----------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1/1/2022 through 1/23/2022  | CrEX-2, CrEX-3, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-4, CrIN-5       | Extraction, treatment, and injection of treated groundwater occurred per operational plan.                                                                                                         |
| 1/23/2022                   | CrEX-4, CrIN-2<br><br>CrEX-2, CrEX-3, CrEX-5, CTUA, CTUC, CrIN-3, CrIN-4, CrIN-5 | CrEX-4 turned off due to a dual-wall pipe containment alarm. CrIN-2 also turned off to balance flow.<br>Extraction, treatment, and injection of treated groundwater occurred per operational plan. |
| 1/23/2022 through 1/24/2022 | CrEX-2, CrEX-3, CrEX-5, CTUA, CTUC, CrIN-3, CrIN-4, CrIN-5                       | Extraction, treatment, and injection of treated groundwater occurred per operational plan.                                                                                                         |

**Table 2.4-1 (continued)**

| <b>Maintenance Date</b>     | <b>Elements Impacted</b>                                                                   | <b>Operation/Maintenance Description</b>                                                                                                                                          |
|-----------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1/24/2022                   | Entire system                                                                              | Turned off all extraction wells, injection wells, and treatment units for cyber security remote updates.                                                                          |
| 1/25/2022 through 1/28/2022 | CrEX-3, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2,                                                | Extraction, treatment, and injection of treated groundwater occurred per operational plan.                                                                                        |
| 1/28/2022 through 3/8/2022  | Entire system                                                                              | Turned off all extraction wells, injection wells, and treatment units to perform maintenance on the system.                                                                       |
| 2/9/2022 through 2/10/2022  | CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5                                                     | Backflush/maintenance pumping conducted at all CrIN well locations. Treatment system remains off.                                                                                 |
| 3/6/2022                    | CrEX-1                                                                                     | Pump replacement at CrEX-1 finished.                                                                                                                                              |
| 3/8/2022 through 3/11/2022  | CrEX-4, CTUC, CrIN-1                                                                       | Extraction, treatment, and injection of treated groundwater occurred per phased start-up plan.                                                                                    |
| 3/12/2022                   | Entire system                                                                              | All extraction wells, injection wells, and treatment units off for phased start-up.                                                                                               |
| 3/13/2022 through 3/17/2022 | CrEX-4, CTUC, CrIN-2                                                                       | Extraction, treatment, and injection of treated groundwater occurred per phased start-up plan.                                                                                    |
| 3/18/2022                   | Entire system                                                                              | All extraction wells, injection wells, and treatment units off for phased start-up.                                                                                               |
| 3/19/2022 through 3/22/2022 | CrEX-4, CTUC, CrIN-3                                                                       | Extraction, treatment, and injection of treated groundwater occurred per phased start-up plan.                                                                                    |
| 3/22/2022                   | Entire system                                                                              | All extraction wells, injection wells, and treatment units off for phased start-up.                                                                                               |
| 3/23/2022                   | CrEX-1                                                                                     | CrEX-1 briefly operated (14 gal. pumped) for operational testing.                                                                                                                 |
| 3/23/2022 through 3/30/2022 | CrEX-2, CrEX-3, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5         | Extraction, treatment, and injection of treated groundwater occurred per operational plan. Entire treatment system back online with the exception of CrEX-1.                      |
| 3/25/2022                   | CrEX-1                                                                                     | CrEX-1 briefly operated (21 gal. pumped) for operational testing.                                                                                                                 |
| 3/30/2022 through 3/31/2022 | CrEX-1, CrEX-2, CrEX-3, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5 | Extraction, treatment, and injection of treated groundwater occurred per operational plan. Entire treatment system back online. CrEX-1 difficulties with phase/rotation remedied. |

## 2.5 Any Periodic Test of Mechanical Integrity Conducted (Requirement 5)

Periodic testing of mechanical integrity was not conducted or reported to NMED during CY 2022 Quarter 1. Mechanical integrity testing was performed and reported to NMED during the CY 2019 Quarter 2 reporting period. In accordance with Condition No. 3, mechanical integrity testing will occur at least once every 5 yr unless a UIC well is reconfigured. Under this scenario, a mechanical integrity test before reinjection of treated effluent at a specific reconfigured well will be completed pursuant to Condition No. 3.

## 2.6 Any Replacement of Primary or Secondary IX Vessels or Associated Treatment System Infrastructure (Requirement 6)

No replacement of primary or secondary IX vessels in either treatment unit CTUA (all three treatment trains) or CTUC (both treatment trains) was performed during the reporting period.

## 2.7 Any Well Workovers Conducted (Requirement 7)

During CY 2022 Quarter 1, the submersible pump and motor were replaced at CrEX-1. The work started on February 22, 2022 and finished on March 6, 2022. CrEX-1 was returned to service on March 30, 2022.

## 2.8 Any Additional Operational Changes with the Potential to Markedly Affect the Discharge (Requirement 8)

During the reporting period, the pilot-scale molasses amendment and sodium dithionite amendment studies continued. In accordance with NMED's conditional approval of these studies, analytical results from iron, manganese, and arsenic testing of the treated water from the extraction wells during the study are being provided in the quarterly monitoring reports under DP-1835. These results for CY 2022 Quarter 1 are provided in Table 2.2-2.

No results for arsenic, iron, or manganese exceeded 90% of the numeric standards of 20.6.2.3103 NMAC or 90% of the numeric standards established for tap water in Table A-1 of the 2021 NMED risk assessment guidance (NMED 2021) for constituents not listed in 20.6.2.3103 NMAC. The 90% values for arsenic, iron, and manganese are 9 µg/L, 900 µg/L, and 180 µg/L, respectively.

Other than the activities cited in section 2.4, no additional operational changes occurred during the reporting period.

## 2.9 Monthly Average, Maximum, and Minimum Values for Flow Rate and Volume of Treated Effluent Transferred to Each UIC Well (Requirement 9)

Table 2.9-1 provides the monthly average, maximum, and minimum values for flow rate and volume of treated effluent transferred to each well in CY 2022 Quarter 1.

**Table 2.9-1**  
**Flows and Volumes of Treated Effluent Injected – CY 2022 Quarter 1, DP-1835**

| Injection Well | Flow rate (gpm <sup>a</sup> ) |         |                      | Daily Volume (gal.) |         |         | Total Volume (gal.) |
|----------------|-------------------------------|---------|----------------------|---------------------|---------|---------|---------------------|
|                | Average <sup>b</sup>          | Maximum | Minimum <sup>c</sup> | Average             | Maximum | Minimum |                     |
| January 2022   |                               |         |                      |                     |         |         |                     |
| CrIN-1         | 53.6                          | 58.5    | 27.1                 | 77,176              | 84,311  | 39,039  | 2,160,924           |
| CrIN-2         | 54.0                          | 61.7    | 10.7                 | 77,804              | 88,837  | 15,370  | 2,100,708           |
| CrIN-3         | 0.0                           | 0.0     | 0.0                  | 0                   | 0       | 0       | 0                   |
| CrIN-4         | 52.4                          | 57.5    | 38.1                 | 75,410              | 82,756  | 54,798  | 1,885,243           |
| CrIN-5         | 54.3                          | 58.0    | 39.8                 | 78,145              | 83,494  | 57,262  | 1,953,625           |

**Table 2.9-1 (continued)**

| Injection Well | Flow rate (gpm <sup>a</sup> ) |         |                      | Daily Volume (gal.) |         |         | Total Volume (gal.) |
|----------------|-------------------------------|---------|----------------------|---------------------|---------|---------|---------------------|
|                | Average <sup>b</sup>          | Maximum | Minimum <sup>c</sup> | Average             | Maximum | Minimum |                     |
| February 2022  |                               |         |                      |                     |         |         |                     |
| CrIN-1         | 0.0                           | 0.0     | 0.0                  | 0                   | 0       | 0       | 0                   |
| CrIN-2         | 0.0                           | 0.0     | 0.0                  | 0                   | 0       | 0       | 0                   |
| CrIN-3         | 0.0                           | 0.0     | 0.0                  | 0                   | 0       | 0       | 0                   |
| CrIN-4         | 0.0                           | 0.0     | 0.0                  | 0                   | 0       | 0       | 0                   |
| CrIN-5         | 0.0                           | 0.0     | 0.0                  | 0                   | 0       | 0       | 0                   |
| March 2022     |                               |         |                      |                     |         |         |                     |
| CrIN-1         | 40.0                          | 61.7    | 0.4                  | 57,540              | 88,892  | 609     | 920,633             |
| CrIN-2         | 40.7                          | 66.5    | 3.8                  | 58,648              | 95,737  | 7       | 938,365             |
| CrIN-3         | 36.7                          | 59.2    | 2.8                  | 52,851              | 85,291  | 4,006   | 739,917             |
| CrIN-4         | 30.4                          | 57.8    | 0.1                  | 43,801              | 83,207  | 157     | 657,016             |
| CrIN-5         | 32.5                          | 58.4    | 0.1                  | 43,618              | 84,063  | 33      | 654,273             |

<sup>a</sup> gpm = Gallons per minute.<sup>b</sup> Average flow rate and daily volume represent arithmetic mean values of results provided during periods when treated groundwater was being injected.<sup>c</sup> Minimum values represent the minimum daily value recorded during days when pumping occurred.**2.10 Total Monthly Volume of Treated Effluent Transferred to Each UIC Well (Requirement 10)**

Table 2.9-1 provides total monthly volumes of treated effluent transferred to each well. As previously identified, injection occurred at UIC wells CrIN-1 through CrIN-5 during CY 2022 Quarter 1.

**2.11 Monthly Average, Maximum, and Minimum Values of Injection Water Level (Pressure Head) Above Static Level for Each UIC Well (Requirement 11)**

Table 2.11-1 provides the monthly average, maximum, and minimum values for injection water level above static level for each UIC well.

**Table 2.11-1**  
**Water-Level Values Above Static Level by UIC Well – CY 2022 Quarter 1, DP-1835**

| UIC Well | January 2022              |              |              | February 2022    |              |              | March 2022   |              |              |
|----------|---------------------------|--------------|--------------|------------------|--------------|--------------|--------------|--------------|--------------|
|          | Average <sup>a</sup> (ft) | Maximum (ft) | Minimum (ft) | Average (ft)     | Maximum (ft) | Minimum (ft) | Average (ft) | Maximum (ft) | Minimum (ft) |
| CrIN-1   | 23.6                      | 29.0         | 18.3         | n/a <sup>b</sup> | n/a          | n/a          | 7.2          | 9.1          | 1.2          |
| CrIN-2   | 11.8                      | 13.5         | 0.7          | n/a              | n/a          | n/a          | 9.8          | 13.2         | 6.4          |
| CrIN-3   | n/a                       | n/a          | n/a          | n/a              | n/a          | n/a          | 2.9          | 3.9          | 2.2          |
| CrIN-4   | 13.6                      | 16.4         | 6.6          | n/a              | n/a          | n/a          | 12.1         | 13.9         | 10.1         |
| CrIN-5   | 24.7                      | 28.5         | 5.7          | n/a              | n/a          | n/a          | 16.6         | 19.6         | 3.3          |

<sup>a</sup> Average values provided represent arithmetic mean values of maximum daily values during periods when treated groundwater was being injected.<sup>b</sup> n/a – Water level data not available or treated groundwater not injected during the month at this location.

**2.12 Daily Volume Injected at Each UIC Well (Requirement 12)**

Daily volumes of groundwater injected (following treatment) during CY 2022 Quarter 1 are presented in Table 2.12-1.

**Table 2.12-1**  
**Daily Injection Summary Table – CY 2022 Quarter 1, DP-1835**

| Date      | CrIN-1<br>(gal.) | CrIN-2<br>(gal.) | CrIN-3<br>(gal.) | CrIN-4<br>(gal.) | CrIN-5<br>(gal.) | Total<br>(gal.) |
|-----------|------------------|------------------|------------------|------------------|------------------|-----------------|
| 1/1/2022  | 82,065           | 80,028           | 0                | 80,597           | 82,912           | 325,602         |
| 1/2/2022  | 75,321           | 82,113           | 0                | 80,616           | 83,346           | 321,396         |
| 1/3/2022  | 74,461           | 80,657           | 0                | 80,667           | 83,494           | 319,279         |
| 1/4/2022  | 74,825           | 82,041           | 0                | 80,626           | 80,051           | 317,542         |
| 1/5/2022  | 74,856           | 82,068           | 0                | 80,735           | 80,647           | 318,306         |
| 1/6/2022  | 77,960           | 82,024           | 0                | 81,315           | 81,583           | 322,882         |
| 1/7/2022  | 80,632           | 82,652           | 0                | 82,156           | 83,042           | 328,483         |
| 1/8/2022  | 81,432           | 70,558           | 0                | 64,553           | 70,428           | 286,971         |
| 1/9/2022  | 79,826           | 83,392           | 0                | 69,913           | 77,807           | 310,938         |
| 1/10/2022 | 79,592           | 87,850           | 0                | 74,930           | 77,382           | 319,753         |
| 1/11/2022 | 79,293           | 82,440           | 0                | 75,061           | 77,116           | 313,910         |
| 1/12/2022 | 82,019           | 55,646           | 0                | 76,383           | 78,148           | 292,195         |
| 1/13/2022 | 84,311           | 83,375           | 0                | 76,308           | 78,769           | 322,763         |
| 1/14/2022 | 83,519           | 83,425           | 0                | 74,833           | 79,030           | 320,807         |
| 1/15/2022 | 83,499           | 80,400           | 0                | 72,224           | 78,863           | 314,986         |
| 1/16/2022 | 81,360           | 87,199           | 0                | 72,985           | 80,665           | 322,209         |
| 1/17/2022 | 77,669           | 87,821           | 0                | 73,449           | 79,717           | 318,656         |
| 1/18/2022 | 78,046           | 87,766           | 0                | 73,398           | 79,159           | 318,369         |
| 1/19/2022 | 77,945           | 86,017           | 0                | 78,106           | 79,945           | 322,013         |
| 1/20/2022 | 77,768           | 87,818           | 0                | 78,358           | 79,915           | 323,858         |
| 1/21/2022 | 77,792           | 88,837           | 0                | 78,268           | 81,553           | 326,450         |
| 1/22/2022 | 74,978           | 87,473           | 0                | 79,275           | 81,566           | 323,293         |
| 1/23/2022 | 79,800           | 61,742           | 0                | 82,756           | 80,367           | 304,664         |
| 1/24/2022 | 63,712           | 0                | 0                | 62,932           | 57,262           | 183,906         |
| 1/25/2022 | 77,145           | 15,370           | 0                | 54,798           | 60,859           | 208,172         |
| 1/26/2022 | 80,647           | 83,593           | 0                | 0                | 0                | 164,240         |
| 1/27/2022 | 81,412           | 86,010           | 0                | 0                | 0                | 167,422         |
| 1/28/2022 | 39,039           | 42,395           | 0                | 0                | 0                | 81,434          |
| 1/29/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 1/30/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 1/31/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/1/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/2/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/3/2022  | 0                | 0                | 0                | 0                | 0                | 0               |

Table 2.12-1 (continued)

| Date      | CrIN-1<br>(gal.) | CrIN-2<br>(gal.) | CrIN-3<br>(gal.) | CrIN-4<br>(gal.) | CrIN-5<br>(gal.) | Total<br>(gal.) |
|-----------|------------------|------------------|------------------|------------------|------------------|-----------------|
| 2/4/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/5/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/6/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/7/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/8/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/9/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/10/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/11/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/12/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/13/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/14/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/15/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/16/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/17/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/18/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/19/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/20/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/21/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/22/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/23/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/24/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/25/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/26/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/27/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/28/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/1/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/2/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/3/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/4/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/5/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/6/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/7/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/8/2022  | 11,779           | 0                | 0                | 195              | 33               | 12,007          |
| 3/9/2022  | 51,551           | 7                | 0                | 361              | 132              | 52,051          |
| 3/10/2022 | 85,249           | 0                | 0                | 0                | 0                | 85,249          |
| 3/11/2022 | 88,892           | 0                | 0                | 0                | 0                | 88,892          |
| 3/12/2022 | 28,360           | 0                | 0                | 0                | 0                | 28,360          |
| 3/13/2022 | 0                | 5,477            | 0                | 189              | 231              | 5,897           |

**Table 2.12-1 (continued)**

| Date                    | CrIN-1<br>(gal.) | CrIN-2<br>(gal.) | CrIN-3<br>(gal.) | CrIN-4<br>(gal.) | CrIN-5<br>(gal.) | Total<br>(gal.) |
|-------------------------|------------------|------------------|------------------|------------------|------------------|-----------------|
| 3/14/2022               | 5,372            | 7,354            | 4,006            | 1,700            | 490              | 18,923          |
| 3/15/2022               | 609              | 58,080           | 0                | 157              | 86               | 58,931          |
| 3/16/2022               | 0                | 95,737           | 0                | 0                | 0                | 95,737          |
| 3/17/2022               | 0                | 94,909           | 0                | 0                | 0                | 94,909          |
| 3/18/2022               | 0                | 45,218           | 0                | 0                | 0                | 45,218          |
| 3/19/2022               | 0                | 0                | 53,590           | 510              | 197              | 54,297          |
| 3/20/2022               | 0                | 0                | 84,700           | 0                | 0                | 84,700          |
| 3/21/2022               | 0                | 0                | 85,291           | 0                | 0                | 85,291          |
| 3/22/2022               | 0                | 0                | 28,477           | 0                | 0                | 28,477          |
| 3/23/2022               | 40,120           | 35,591           | 36,647           | 41,806           | 40,831           | 194,996         |
| 3/24/2022               | 77,786           | 67,692           | 59,008           | 74,476           | 74,464           | 353,426         |
| 3/25/2022               | 82,178           | 69,733           | 59,017           | 77,259           | 74,721           | 362,908         |
| 3/26/2022               | 76,573           | 70,988           | 59,069           | 78,098           | 75,587           | 360,315         |
| 3/27/2022               | 70,733           | 77,461           | 59,018           | 74,170           | 75,383           | 356,765         |
| 3/28/2022               | 71,364           | 76,744           | 59,957           | 73,655           | 75,459           | 357,179         |
| 3/29/2022               | 70,068           | 75,159           | 48,063           | 73,536           | 75,375           | 342,201         |
| 3/30/2022               | 77,445           | 74,341           | 48,336           | 77,696           | 77,219           | 355,038         |
| 3/31/2022               | 82,554           | 83,874           | 54,736           | 83,207           | 84,063           | 388,435         |
| <b>Total 12,010,704</b> |                  |                  |                  |                  |                  |                 |

**2.13 Daily Volume Pumped from Each Extraction Well (Requirement 13)**

Daily volumes of groundwater pumped from extraction wells during CY 2022 Quarter 1 are presented in Table 2.13-1.

**Table 2.13-1**  
**Daily Extraction Summary Table – CY 2022 Quarter 1, DP-1835**

| Date     | CrEX-1<br>(gal.) | CrEX-2<br>(gal.) | CrEX-3<br>(gal.) | CrEX-4<br>(gal.) | CrEX-5<br>(gal.) | Total<br>(gal.) |
|----------|------------------|------------------|------------------|------------------|------------------|-----------------|
| 1/1/2022 | 0                | 90,739           | 50,374           | 79,484           | 103,709          | 324,307         |
| 1/2/2022 | 0                | 90,434           | 46,619           | 80,146           | 104,389          | 321,589         |
| 1/3/2022 | 0                | 90,679           | 40,108           | 80,612           | 105,062          | 316,461         |
| 1/4/2022 | 0                | 90,684           | 38,896           | 80,672           | 104,939          | 315,192         |
| 1/5/2022 | 0                | 90,690           | 38,865           | 84,130           | 104,438          | 318,123         |
| 1/6/2022 | 0                | 90,510           | 39,911           | 85,948           | 103,838          | 320,206         |
| 1/7/2022 | 0                | 90,711           | 43,196           | 84,949           | 106,019          | 324,875         |
| 1/8/2022 | 0                | 78,266           | 41,005           | 70,231           | 85,972           | 275,475         |
| 1/9/2022 | 0                | 90,677           | 44,349           | 79,147           | 103,709          | 317,881         |

Table 2.13-1 (continued)

| Date      | CrEX-1<br>(gal.) | CrEX-2<br>(gal.) | CrEX-3<br>(gal.) | CrEX-4<br>(gal.) | CrEX-5<br>(gal.) | Total<br>(gal.) |
|-----------|------------------|------------------|------------------|------------------|------------------|-----------------|
| 1/10/2022 | 0                | 90,765           | 44,985           | 78,292           | 103,668          | 317,711         |
| 1/11/2022 | 0                | 90,714           | 48,570           | 79,321           | 94,611           | 313,216         |
| 1/12/2022 | 0                | 90,835           | 52,611           | 80,840           | 67,974           | 292,260         |
| 1/13/2022 | 0                | 90,505           | 47,515           | 80,588           | 102,238          | 320,846         |
| 1/14/2022 | 0                | 90,813           | 47,514           | 76,599           | 102,293          | 317,219         |
| 1/15/2022 | 0                | 90,861           | 47,399           | 76,315           | 102,289          | 316,864         |
| 1/16/2022 | 0                | 90,860           | 47,794           | 76,586           | 102,257          | 317,498         |
| 1/17/2022 | 0                | 90,723           | 47,414           | 77,138           | 102,340          | 317,615         |
| 1/18/2022 | 0                | 90,846           | 42,103           | 77,783           | 102,726          | 313,457         |
| 1/19/2022 | 0                | 86,352           | 46,997           | 81,221           | 102,818          | 317,388         |
| 1/20/2022 | 0                | 91,092           | 47,427           | 83,549           | 103,088          | 325,155         |
| 1/21/2022 | 0                | 91,224           | 46,263           | 83,539           | 102,565          | 323,590         |
| 1/22/2022 | 0                | 91,292           | 46,106           | 83,195           | 102,250          | 322,843         |
| 1/23/2022 | 0                | 91,706           | 49,739           | 58,913           | 103,264          | 303,622         |
| 1/24/2022 | 0                | 65,461           | 39,035           | 0                | 76,815           | 181,311         |
| 1/25/2022 | 0                | 0                | 36,457           | 0                | 71,147           | 107,604         |
| 1/26/2022 | 0                | 0                | 58,247           | 0                | 110,900          | 169,147         |
| 1/27/2022 | 0                | 0                | 54,425           | 0                | 110,856          | 165,282         |
| 1/28/2022 | 0                | 0                | 24,662           | 0                | 52,754           | 77,416          |
| 1/29/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 1/30/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 1/31/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/1/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/2/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/3/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/4/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/5/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/6/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/7/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/8/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/9/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/10/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/11/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/12/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/13/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/14/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/15/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/16/2022 | 0                | 0                | 0                | 0                | 0                | 0               |

Table 2.13-1 (continued)

| Date      | CrEX-1<br>(gal.) | CrEX-2<br>(gal.) | CrEX-3<br>(gal.) | CrEX-4<br>(gal.) | CrEX-5<br>(gal.) | Total<br>(gal.) |
|-----------|------------------|------------------|------------------|------------------|------------------|-----------------|
| 2/17/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/18/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/19/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/20/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/21/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/22/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/23/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/24/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/25/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/26/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/27/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 2/28/2022 | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/1/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/2/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/3/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/4/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/5/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/6/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/7/2022  | 0                | 0                | 0                | 0                | 0                | 0               |
| 3/8/2022  | 0                | 0                | 0                | 23,611           | 0                | 23,611          |
| 3/9/2022  | 0                | 0                | 0                | 52,661           | 0                | 52,661          |
| 3/10/2022 | 0                | 0                | 0                | 85,584           | 0                | 85,584          |
| 3/11/2022 | 0                | 0                | 0                | 86,420           | 0                | 86,420          |
| 3/12/2022 | 0                | 0                | 0                | 34,175           | 0                | 34,175          |
| 3/13/2022 | 0                | 0                | 0                | 5,069            | 0                | 5,069           |
| 3/14/2022 | 0                | 0                | 0                | 11,706           | 0                | 11,706          |
| 3/15/2022 | 0                | 0                | 0                | 57,812           | 0                | 57,812          |
| 3/16/2022 | 0                | 0                | 0                | 93,582           | 0                | 93,582          |
| 3/17/2022 | 0                | 0                | 0                | 93,667           | 0                | 93,667          |
| 3/18/2022 | 0                | 0                | 0                | 43,972           | 0                | 43,972          |
| 3/19/2022 | 0                | 0                | 0                | 54,931           | 0                | 54,931          |
| 3/20/2022 | 0                | 0                | 0                | 86,288           | 0                | 86,288          |
| 3/21/2022 | 0                | 0                | 0                | 86,118           | 0                | 86,118          |
| 3/22/2022 | 0                | 0                | 0                | 29,693           | 0                | 29,693          |
| 3/23/2022 | 14               | 47,302           | 37,550           | 49,251           | 62,685           | 196,801         |
| 3/24/2022 | 0                | 90,785           | 72,313           | 83,411           | 109,425          | 355,933         |
| 3/25/2022 | 21               | 90,874           | 73,970           | 82,637           | 109,359          | 356,861         |
| 3/26/2022 | 0                | 92,129           | 73,476           | 79,797           | 112,879          | 358,281         |

**Table 2.13-1 (continued)**

| Date                    | CrEX-1<br>(gal.) | CrEX-2<br>(gal.) | CrEX-3<br>(gal.) | CrEX-4<br>(gal.) | CrEX-5<br>(gal.) | Total<br>(gal.) |
|-------------------------|------------------|------------------|------------------|------------------|------------------|-----------------|
| 3/27/2022               | 0                | 91,898           | 73,415           | 78,598           | 112,459          | 356,370         |
| 3/28/2022               | 9                | 91,813           | 73,421           | 77,330           | 112,171          | 354,744         |
| 3/29/2022               | 0                | 91,097           | 57,998           | 82,273           | 109,618          | 340,986         |
| 3/30/2022               | 51,418           | 76,976           | 45,173           | 83,725           | 103,430          | 360,722         |
| 3/31/2022               | 107,895          | 66,892           | 41,152           | 77,308           | 92,420           | 385,668         |
| <b>Total 11,865,808</b> |                  |                  |                  |                  |                  |                 |

## 2.14 Facility Layout Map (Requirement 14)

Figure 2.14-1 is the facility layout map for CY 2022 Quarter 1, showing the location and number of each well.

## 2.15 Groundwater Elevation Contour Map (Requirement 15)

Figure 2.3-1 provides the groundwater elevation contour map. Section 2.3 provides an explanation of how this map was generated.

## 3.0 REFERENCES

- LANL (Los Alamos National Laboratory) October 2009. "Investigation Report for Sandia Canyon," Los Alamos National Laboratory document LA-UR-09-6450, Los Alamos, New Mexico (LANL 2009).
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- NMED (New Mexico Environment Department) June 27, 2017. "Response to Notice of Intent to Discharge; Discharge Permit Not Required for Los Alamos National Laboratory Pilot Scale Molasses Amendment Study in Regional Aquifer Monitoring Well R-28, AI:856 PRD20170003," New Mexico Environment Department letter to J.C. Bretzke (LANL) and A.Q. Duran (EM-LA) from M. Hunter (NMED-GWQB), Santa Fe, New Mexico (NMED 2017a).
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- NMED (New Mexico Environment Department) November 2021. "Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Soil Screening Guidance for Human Health Risk Assessments," Hazardous Waste Bureau and Ground Water Quality Bureau, Santa Fe, New Mexico (NMED 2021).



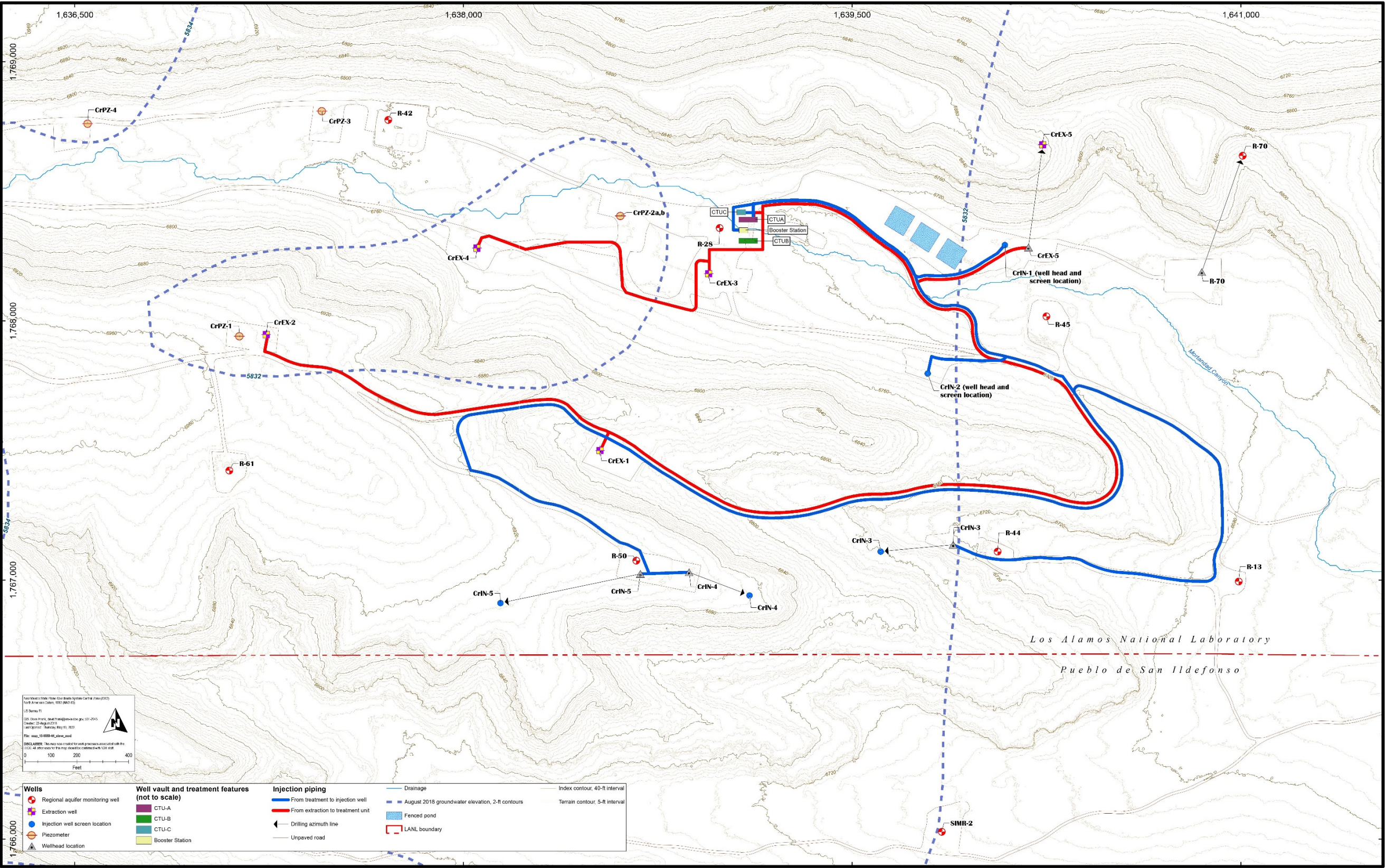


Figure 2.14-1 Facility layout map – CY 2022 Quarter 1, DP-1835

